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CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ORIGINAL ARTICLES

Mental Health Despite Mental Retardation
A. F. ALFORD, M.B. 1233
Glutamic Acid in Hepatic Coma
J. M. WALSHE, M.R.C.P. 1235
Fœtor Hepaticus
Prof. F. CHALLENGER, D.SC.
J. M. WALSHE, M.R.C.P. 1239
The Treatment of Eclampsia (Imminent or Actual) by Continuous Conduction Analgesia
R. BRYCE-SMITH, F.F.A.R.C.S.
E. O. WILLIAMS, M.R.C.O.G. 1241
Muscle Imbalance in the Causation of Scoliosis
H. F. V. RIDDLE, B.SC.
ROBERT ROAF, F.R.C.S. 1245
Reducing Observer Error in a 70-mm. Chest-radiography Service for General Practitioners
PETER STRADLING, M.R.C.P.
R. N. JOHNSTON, M.R.C.P. ... 1247
The Sterilisation of Blankets with Cetyl Trimethylamine Bromide
ROBERT BLOWERS, M.D.
K. R. WALLACE, M.B. 1250
Estimation of Blood-oxygen Saturation
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Idiopathic Granular Proctitis
C. F. J. CROPPER, F.R.C.P.E. 1253

NEW INVENTIONS

Harness for Endotracheal Tube
HEDLEY ROLFE, M.R.C.S. ... 1256

SPECIAL ARTICLES

The Young Long-stay Patient in Hospital
M. U. SHARP, M.A. 1263
"Minor" Addictions 1264
Birthday Honours 1266

IN ENGLAND NOW

A Running Commentary by Peripatetic Correspondents ... 1273

LEADING ARTICLES

BY ANY OTHER NAME 1257
BIOCHEMICAL DISTURBANCE IN HEPATIC COMA 1258
AN INCOMPLETE REFORM 1259

ANNOTATIONS

Rest and Activity in Acute Nephritis 1261
Radiography of the Colon 1261
Dangerous Cots 1261
Peroneal Spastic Flat-foot 1262
Birthday Honours 1262

PUBLIC HEALTH

Lymphocytic Meningoencephalitis
J. O'H. TOBIN, B.M. 1267
Dental Care for Mothers and Children 1269
Infectious Diseases in England and Wales 1270
Poliomyelitis Vaccine 1270

LETTERS TO THE EDITOR

Children's Teeth (Mr. Edward Line, B.D.S.) 1274
Psychosomatic Diseases in Underdeveloped Areas (Dr. B. S. Rose) 1274
Hypersensitivity Angiitis (Dr. Geoffrey Rose) 1275
Lung Cancer in Asbestosis (Dr. J. F. Knox) 1275
Cyclical Vomiting (Dr. H. A. Reimann) 1276
Proteinuria (Dr. J. J. Segall) 1276
The Action of Chlorpromazine (Dr. Philippe Decourt) 1276
Chlorpromazine and Epilepsy (Dr. Walter Fabisch) 1277
Heroin (Dr. D. R. Laurence) 1277
Lung Cancer and Smoking (Dr. Richard Doll, Prof. A. Bradford Hill, D.SC., F.R.S.) 1278
Investigation of Tonsillectomy (Mr. D. F. Ellison Nash, F.R.C.S.) 1278
Tuberculosis in Eire (Mr. L. Pitcher, M.R.C.V.S.) 1278
Food in Mental Hospitals (Mrs. E. L. M. Pulvertaft) 1278
The Difficult Appendix (Mr. J. A. Kerr, F.R.C.S.) 1279

REVIEWS

Notices of Books 1255

PARLIAMENT

The Queen's Speech 1270
Question Time 1271

MEDICINE AND THE LAW

A Difficult Transfusion 1271
Coitus Interruptus 1272
Refusal to have a Child 1272
Baby Sent Out too Soon ? 1273
Newspaper's Account of an Operation 1273

OBITUARY

Reginald Langdon Langdon-Down 1279
John Everidge 1280
Robert Arthur Lyster 1280
Edward Cecil Clements 1280

NOTES AND NEWS

Mental Nursing Filmed Again .. 1281
A Doctor and the Rail Strike ... 1281

University of Oxford 1281
University of Cambridge 1281
University of Durham 1281
Royal College of Physicians of London 1282
Royal College of Surgeons of England 1282
Royal College of Physicians of Ireland 1282
Royal Australasian College of Physicians 1282
Royal Society of Medicine 1282
Medical Association for the Prevention of War 1282
Oxford Graduates' Medical Club 1282
Hospitals' Symphony Orchestra 1282
United States Supreme Court ... 1282
Canadian Nuffield Fellows 1282

Diary of the Week 1281
Appointments 1281

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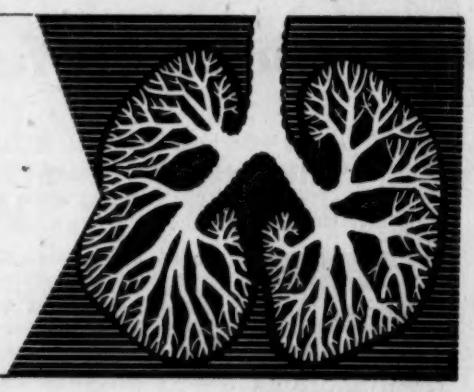

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N.H.S. BASIC PRICE 12/6 for 500 tablets in foil.

RECKITT & COLMAN LTD., HULL & LONDON (PHARMACEUTICAL DEPT., HULL)

Veracolate is indicated in chronic cholecystitis, for the "bilious attack" and in constipation. It is a cherry-red tablet containing bile salts which encourage the production of normal bile. It also helps to keep the bile freely flowing, and has laxatives added to correct the constipation so often accompanying biliary stasis.

ACTIVE CONSTITUENTS: *Sodium taurocholate and sodium glycocholate, each 1.07 gr., ext. cascara sagrada 1.00 gr., phenolphthalein 0.50 gr., oleoresin capsicum 0.04 gr.*

PACKING: *Bottles 50 & 100 tablets; bottles of 500 for dispensing purposes only supplied at 15/-, exempt from Purchase Tax on prescription.*

Veracolate

No Warner preparation has ever been advertised to the public.

WILLIAM R. WARNER & CO. LTD., Power Road, London, W.4.

SYRIAC AMULET

This ancient amulet shows the Angel Gabriel mounted on a white horse driving his spear into the body of the devil-woman of the Evil Eye. It was considered to preserve mankind from attacks of devils.

TODAY staphylococcal, streptococcal and pneumococcal infections are attacked by the selective action of ERYTHROCIN. Tissue-thin *Filmtab* starts to disintegrate within 30 seconds—makes ERYTHROCIN Stearate available for immediate absorption. Tests show Stearate form definitely protects drug from stomach acid. Patients get high inhibitory blood levels of ERYTHROCIN in 2 hours or less. Peak concentration is reached at 4 hours, with significant levels for 8 hours. Low in toxicity ERYTHROCIN is less likely to alter normal intestinal flora than most other antibiotics. ERYTHROCIN *100 or 200 mg.* Filmtabs *are available in bottles of 25 and 100. For little patients 60 cc. bottles of ready-to-use Oral Suspension.*

ERYTHROCIN *(ERYTHROMYCIN STEARATE ABBOTT)*

Abbott

ABBOTT LABORATORIES LTD · PERIVALE · GREENFORD · MIDDLESEX

PREGNAVITE

Guardian of maternal well-being. Simple routine treatment with PREGNAVITE provides a comprehensive range of vitamins and minerals in quantities specifically designed to supply the enhanced dietary needs peculiar to pregnancy.

Dispensing packs of 1,000 *Basic price to N.H.S. 1,000 tablets . . 32/9*

VITAMINS LIMITED UPPER MALL, LONDON · W.6

VITAVEL SYRUP *for Children*

the delicious flavour of Vitavel Syrup solves the problem of ensuring continuity of treatment where supplementation is indicated.

Basic Price to N.H.S. { 6 fl. ozs. - - - 2/6 ; 40 fl. ozs. - - - 16/-

BEMAX *for all ages*

BEMAX provides the richest natural vitamin-protein-mineral dietary supplement.
Now available in two forms
Plain and Chocolate-Flavoured.

An entirely NEW anti-bacterial agent for local application

'Hibitane'

Trade Mark (Chlorhexidine)

REFERENCES :
Brit. Med. J. (1955), i. 81. ibid. (1955), i. 985. Brit. J. Pharmacol. Chemother. (1954), 9, 192.

'Hibitane' Concentrate 2% Specially prepared to be diluted for ordinary antiseptic purposes. Mildly detergent and anti-rusting.

'Hibitane' Powder For the preparation of pure aqueous and alcoholic solutions, incorporation in creams, ointments, etc.

'Hibitane' Antiseptic Cream 1% For lasting disinfection of the hands and prevention of cross infection. Also as a beneficial skin application.

'Hibitane' Obstetric Cream 1% A non-irritant antiseptic lubricant for vaginal examinations. Combines rapid and complete antibacterial action with persistent effect.

ICI

IMPERIAL CHEMICAL (PHARMACEUTICALS) LIMITED · WILMSLOW · MANCHESTER
A subsidiary company of Imperial Chemical Industries Ltd. Ph. 880

Nervous dyspepsia has become a problem to be reckoned with, provoking investigation and research and suggestions for remedies . . . 'Merbentyl' is one of the newest and most effective. It is an antispasmodic with both neurotropic and musculotropic effect upon smooth muscle of the gastro-intestinal and genito-urinary tracts, producing excellent results in the relief of painful spasm associated with functional and organic gastro-intestinal disease. Compared with other antispasmodics both natural and synthetic, 'Merbentyl' is strikingly free from side-effects.

MERBENTYL *Tablets each containing 10 mg. Diethylaminocarbethoxybicyclohexyl hydrochloride.*

MERBENTYL WITH PHENOBARBITONE *Tablets each containing 10 mg. Diethylaminocarbethoxybicyclohexyl hydrochloride and 15 mg. (gr. ¼) Phenobarbitone.*

Each in bottles of 50 and 250 tablets. The basic N.H.S. cost of treatment is less than 5d. a day.

Merbentyl Plain and Merbentyl with Phenobarbitone (each 5 c.c. containing 15 mg. Phenobarbitone) are also available in Syrup form.

MERBENTYL REGD

distributed in the United Kingdom & Eire by
RIKER LABORATORIES LIMITED, LOUGHBOROUGH, LEICS.
for the Wm. S. Merrell Company, London.

Undisturbed by Allergic Reactions

The wide field covered by such conditions as hay fever, allergic rhinitis, allergic conjunctivitis, many cases of pruritus, allergic dermatoses, drug rashes, eczema, urticaria, neuro-dermatitis, serum sickness and anaphylactic shock requires a compound with a wide therapeutic indication and good tolerance. Such a compound is SYNOPEN, and there are many authentic and reputable clinical reports testifying to its profound therapeutic effect on all such conditions. SYNOPEN is the ideal antihistaminic compound for use in general practice.

SYNOPEN

REGD. TRADE MARK

N-dimethyl-aminoethyl-N-p-chlorbenzyl-α-aminopyridine hydrochloride

Available in tablets containing 25 mg. in packings of 20, 100 and 200

Prescribable on N.H.S. Form E.C. 10.

Detailed literature and sample available on request.

Geigy

GEIGY PHARMACEUTICAL COMPANY LTD.
Rhodes, Middleton, MANCHESTER

PH. 78

*BB 15

*Terramycin S F

BRAND OF OXYTETRACYCLINE WITH VITAMINS

*Tetracyn S F

BRAND OF TETRACYCLINE WITH VITAMINS

to fight infection,

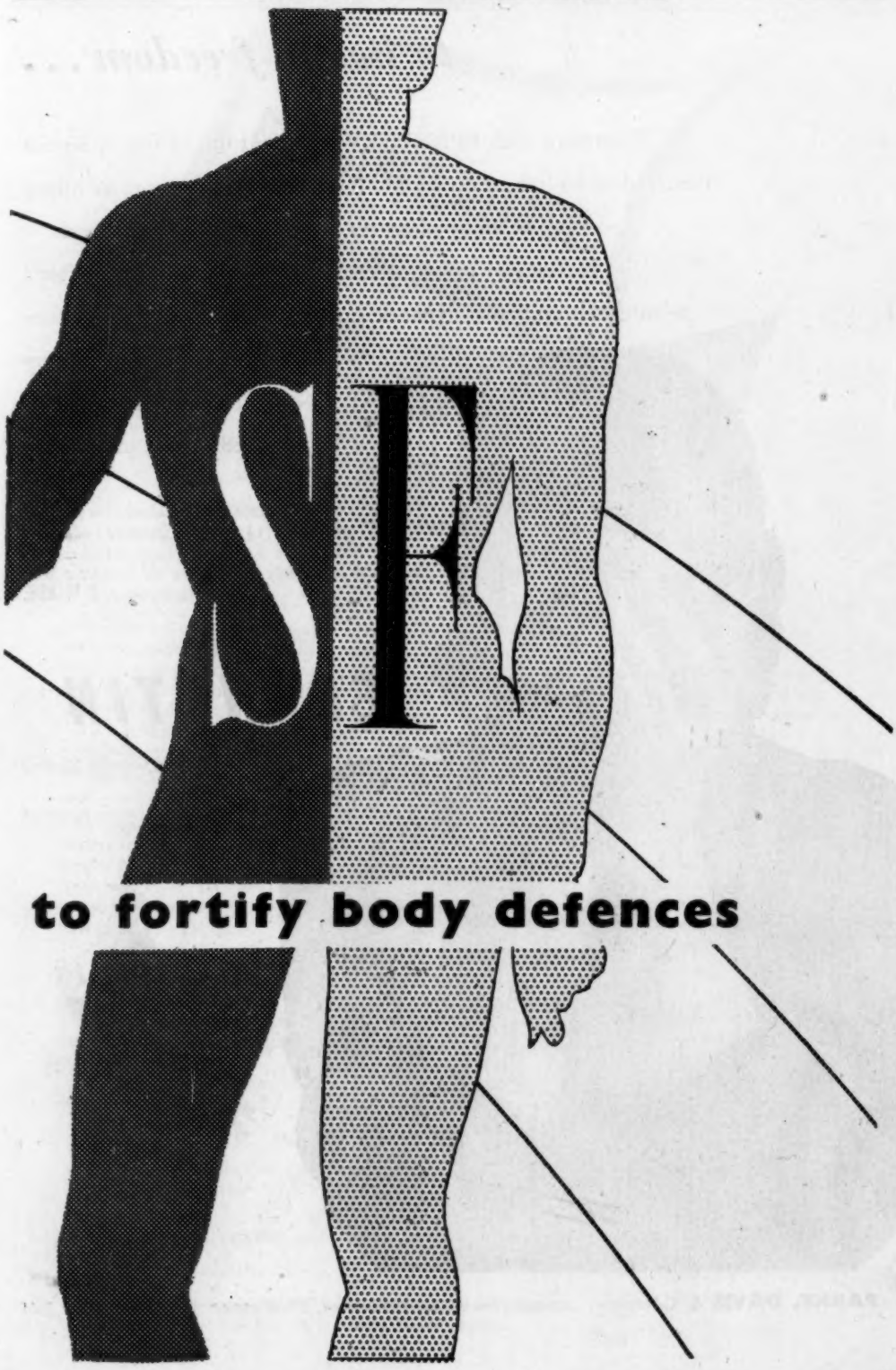
TERRAMYCIN S.F. and TETRACYN S.F. capsules provide in addition to the average daily adult dose of each antibiotic (1.0 g.) the specific therapeutic dosage of water soluble vitamins as well as vitamin K:

ASCORBIC ACID 300 MG. · THIAMINE MONONITRATE 10 MG.
RIBOFLAVIN 10 MG. · NICOTINAMIDE 100 MG. · MENAPHTHONE 2 MG.
(VITAMIN K ANALOGUE)

WORLD'S LARGEST PRODUCER OF ANTIBIOTICS Pfizer

PFIZER LIMITED FOLKESTONE KENT

*TRADE MARK CHAS. PFIZER & CO. INC.


SK
to fortify body defences

to live in freedom . . .

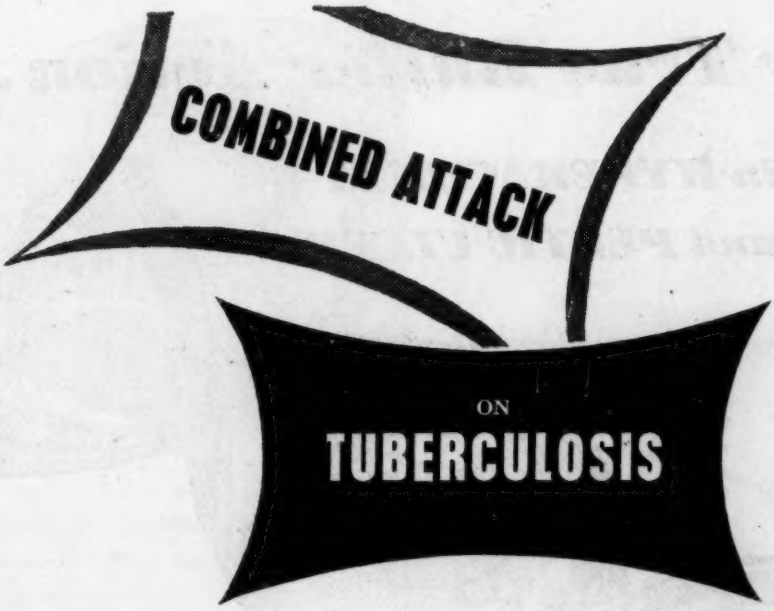
Treatment with EPANUTIN gives four out of five epileptics the freedom to live a normal life. It enables them to work as others do and to enjoy pleasures normally beyond their reach. It prevents or greatly decreases the severity of the patient's seizures with minimal hypnotic or narcotic effects. In cases where an added sedative effect is necessary EPANUTIN & PHENOBARBITONE is an effective combination.

Epanutin & Phenobarbitone capsules containing 0.1 *g.* (1½ *grains*) *Epanutin* (*phenytoin sodium*) *with* 0.05 *g.* (¾ *grain*) *phenobarbitone may also be usefully employed in the transition from phenobarbitone to Epanutin.*

EPANUTIN

● Epanutin Capsules (1½ grs.) and Epanutin with Phenobarbitone Capsules are obtainable in bottles of 100 and 1,000.

PARKE, DAVIS & Company, Limited *(Inc. U.S.A.)*, Hounslow, Middlesex. Tel.: Hounslow 2361



It is accepted that one of the most effective chemotherapeutic weapons against *M. tuberculosis* is isoniazid; but resistance to this substance develops notoriously quickly. Isoniazid, therefore, is always combined with other tuberculostatic substances designed to delay the appearance of resistant strains.

In our laboratories close attention has been paid to the combined therapy of tuberculosis. Two highly effective combinations are :—

Nupasal-213 and Isoniazid. NUPASAL-213, developed originally as an alternative to isoniazid, was reported recently (1) to be almost as active as its parent substance. Being much less toxic its dosage can be higher. The combination of the two is highly tuberculostatic, giving maximum mutual protection against the emergence of resistance (2, 3).

Pycamisan (P.A.S. and Isoniazid). According to a recent Medical Research Council report (4), the combination of P.A.S. and isoniazid is a very effective one. The PYCAMISAN cachet, " made to measure " in two strengths, makes possible correct dosage with the least wastage of time and effort.

Finally it should be remembered that each of the combinations quoted above can reinforce the effect of the other, when used in rotation.

1. Transactions 13th Conference on Chemotherapy of Tuberculosis, Veterans Administration, 1954, Feb., 374.

2. *Proc. Ex. Biol. Med.*, 1954, **87**, 245.

3. *Lancet*, 1955, **1**, 303.

4. Report to M.R.C. of Tuberculosis Chemotherapy Trials Committee, *Brit. Med. J.*, 1955, **1**, 435.

Armamentarium :

Nupasal-213 (o-hydroxybenzal isonicotinyl hydrazone) : TABLETS of 100 and 250 mg. in containers of 100 and 500.

Pycazide (isonicotinic acid hydrazide or isoniazid) : TABLETS of 50 and 100 mg. in containers of 100, 500 and 1,000. AMPOULES each containing 50 mg. in 2 ml. sterile aqueous solution, in boxes of 12. SYRUP, blackcurrant flavoured, in bottles of 20 and 80 fl. oz. One teaspoonful equivalent to about 20 mg. isoniazid.

Pycamisan ('Pycazide' brand isoniazid combined with 'Paramisan Sodium' brand sodium aminosalicylate B.P.) : CACHETS in containers of 100 and 500.

'Pycamisan PH20' : 16 cachets per day provide 20 G. P.A.S. combined with 200 mg. isoniazid.

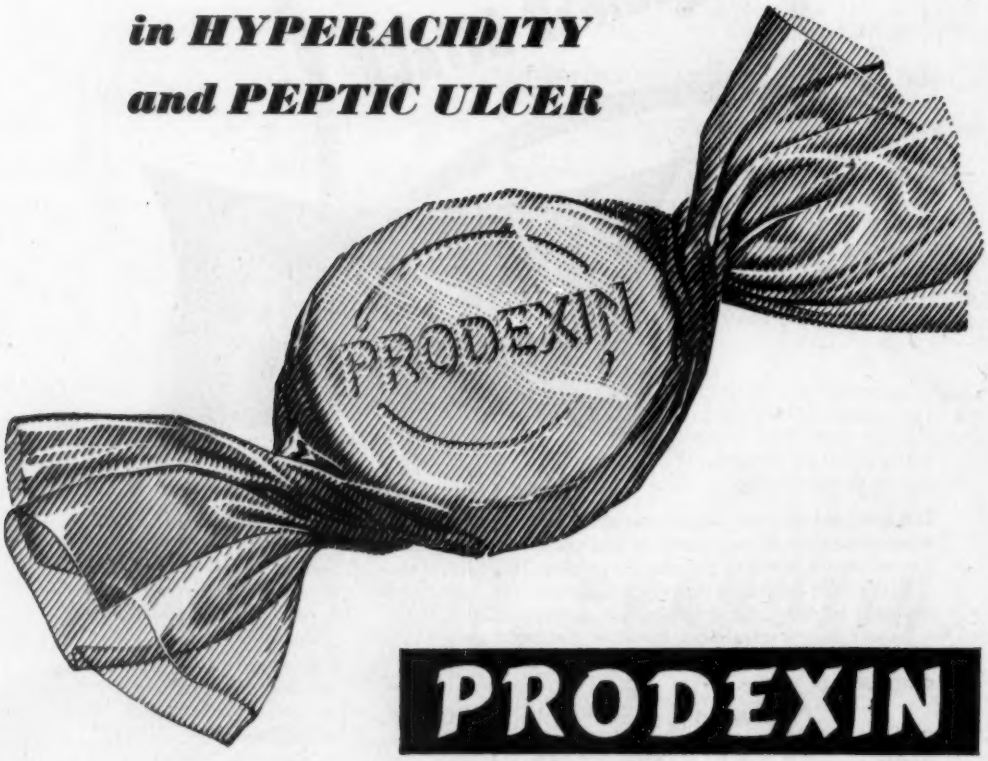
'Pycamisan PH10' : 8 cachets per day provide 10 G. P.A.S. combined with 200 mg. isoniazid.

Further information and prices from Smith & Nephew Ltd., Welwyn Garden City · Herts.

S&N

For True Buffer Action...

in HYPERACIDITY and PEPTIC ULCER



PRODEXIN

Prodexin has all the attributes of a true buffer, and more besides:

- **it keeps gastric acidity down to an equable level (*p*H 3·5 to 4·5).**
- **it does not alkalise the stomach contents, so that acid rebound cannot occur.**
- **its effect is consistent and prolonged.**
- **it does not vary in potency.**
- **it is pleasant and safe to take and is free from grittiness.**

FORMULA

Aluminium glycinate	0·9 gm
Magnesium carbonate	0·1 gm

Reference: *Practitioner*, **173**: 46, 1954.

PACKAGES
Cartons of 30 individually wrapped tablets.
Dispensing packs of 240 tablets.

C. L. BENCARD LTD. PARK ROYAL LONDON, N.W.10

for the

treatment or prophylaxis

of

Labyrinthine Disturbances

The value of " Dramamine " in the control of all forms of motion sickness is well established. More than this, however, it is now recognised that " Dramamine " is most effective in the control of other labyrinthine disturbances, so that it is indicated in the treatment or prophylaxis of any condition of abnormal stimuli of the tissues including end organs (gastro-intestinal tract, eyes) and their neural pathways to the labyrinth. Side-effects of " Dramamine " are so slight that dosage may be continued over long periods if necessary.

SEARLE

Dramamine*

Brand of dimenhydrinate

Thus conditions in which " Dramamine " has been most effective include vertigo due to hypertension, fenestration procedures and labyrinthitis ; Menière's syndrome, irradiation sickness, and in the symptomatic control of nausea and vomiting due to pregnancy, electro-convulsive therapy, narcotisation and certain drugs (antibiotics, etc.).

" Dramamine " may be administered orally, or rectally. It is supplied as 50 mg. tablets, in bottles of 12, 36 and 1,000 and in cartons (10 strips of 10 tablets).

Literature on request

*REGISTERED TRADE MARK

SEARLE

Ethical Pharmaceuticals since 1888

G.D. SEARLE & CO., LTD.

17, Manchester Street
London, W.1.

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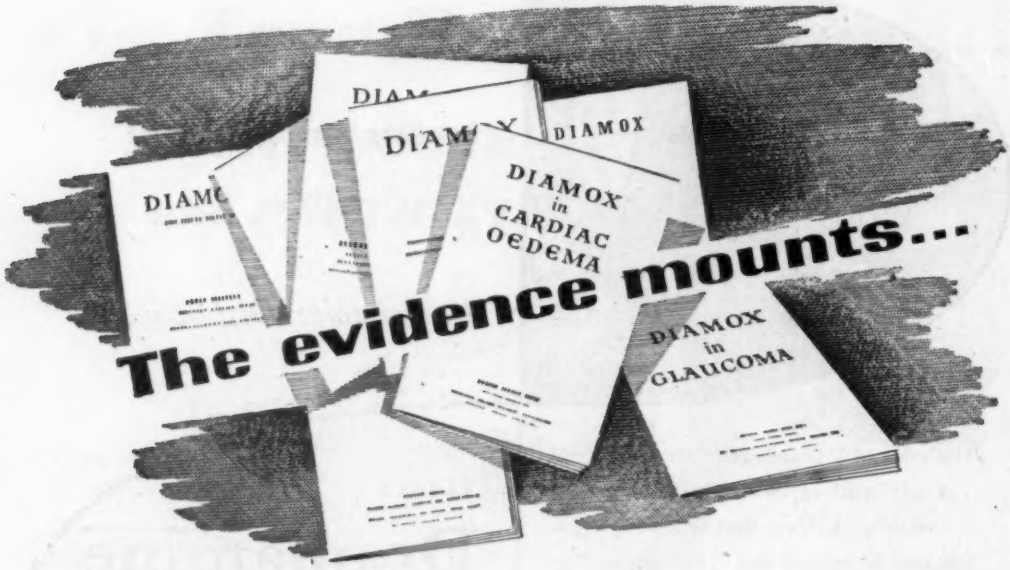

As more and more doctors are adopting the use of DIAMOX Acetazoleamide in the control of cardiac oedema, evidence is rapidly accumulating to show how satisfactorily the early expectations of the drug are being fulfilled. Preference for this new approach to diuresis by the oral administration of DIAMOX is based on the safety and simplicity of the therapy and the rapidity and efficiency of its results. A single morning dose produces copious diuresis lasting 6—12 hours. Encouraging results have also been obtained in glaucoma with DIAMOX which inhibits the secretion of aqueous humour and, by so doing, decreases intraocular pressure. DIAMOX is neither a mercurial nor xanthine derivative.

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ACETAZOLEAMIDE Lederle

POTENT SAFE ORAL DIURETIC

For the long-term treatment of cardiac oedema

Bottles of 25 *and* 100. 250 *mg. tablets*

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Lederle **LEDERLE LABORATORIES DIVISION**

Cyanamid Products Ltd. **BUSH HOUSE, ALDWYCH, LONDON, W.C.2 TEMPLE BAR 5411**

the *new* diabetic has such advantages

To-day, the new diabetic has many facilities to enable him to lead and enjoy a normal life. The introduction of I.Z.S. (Insulin Zinc Suspension) A.B. has greatly simplified the treatment of the majority of cases, one injection being sufficient to control the blood-sugar level for 24 hours.

I.Z.S. offers the following advantages over other prolonged action insulin preparations :—

1. No protein or peptide material present other than insulin itself.
2. Rapid onset with prolonged action.
3. It meets the needs of a higher percentage of diabetics.

I.Z.S. (Insulin Zinc Suspension) A.B. is supplied in vials of 10 c.c. containing 40 or 80 units per c.c.

Insulin Zinc Suspension 'AB'

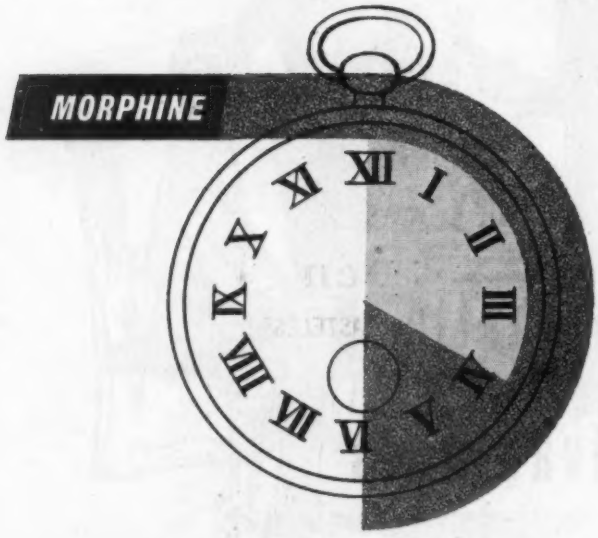
TRADE MARK

JOINT LICENSEES AND MANUFACTURERS

ALLEN & HANBURYS LTD LONDON E2 • THE BRITISH DRUG HOUSES LTD LONDON N1

'DROMORAN'

'Roche'



EFFECTIVE TIME

4-6 HOURS

EFFECTIVE TIME

6-8 HOURS

PACKINGS

Tablets: 1·5 mg. in packings of 20 and 200.
Ampoules: 2 mg. in 1 c.c. in packings of 6 and 50.

Effective by mouth

ROCHE PRODUCTS LIMITED - 15 MANCHESTER SQUARE - LONDON - W.1

Penicillin to meet the needs of General Practice

PERMAPEN*

by mouth

Permapen tablets

STABLE - TASTELESS - ECONOMICAL

Pack of 18 foil wrapped scored tablets each 200,000 units

for children
and the elderly

Permapen oral suspension

PLEASANT TO TAKE - READY PREPARED

Bottles 60 ml.—300,000 units per large teaspoonful

by injection

Permapen Plus

FOR RAPID, PERSISTENT & SUSTAINED ACTION

Single dose vials containing 600,000 units

*Trade Mark of Chas. Pfizer & Co. Inc.

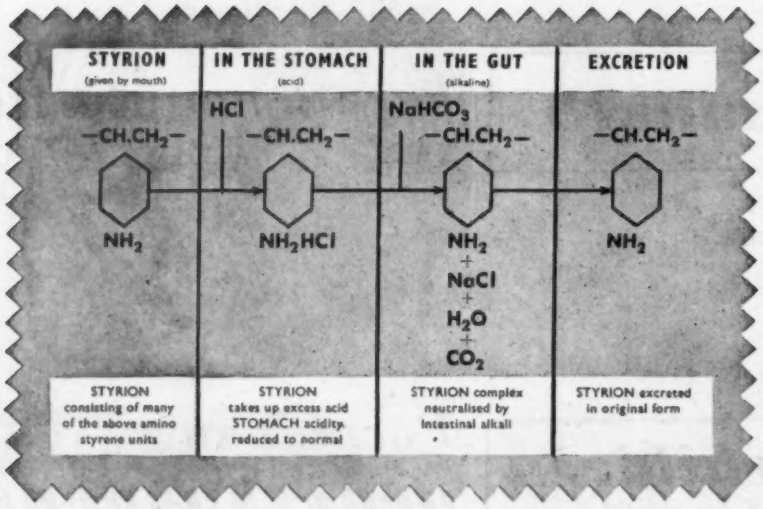
Pfizer *World's Largest Producer of Antibiotics*

Full literature is available and will be supplied on request

PFIZER LTD · FOLKESTONE · KENT · tel: Folkestone 51771

Introducing

a tailor-made corrective for hyperacidity



GLAXO **STYRION** TABLETS

Trade mark

The outstanding fact about Styrion, Glaxo's new preparation, is that it neutralises only the excess acid in the stomach. Its use eliminates risk of the after-effects associated with over-neutralisation. The importance of this in a class of remedies widely used without medical supervision will be appreciated. Over-dosage has no Nemesis: Styrion brings nothing but relief.

Styrion contains polyaminostyrene, an 'ion exchange' (acid-binding) resin, which can be chemically 'tailored' to act selectively. In the stomach Styrion forms an insoluble resin-acid complex. As the degree of acidity declines, so does the activity of Styrion—until normal physiological range is re-established. The excess acid is then neutralised in the alkalinity of the small intestine while Styrion is excreted in the form in which it was given.

Styrion is the nearest approach to the ideal antacid, therapeutically efficient, non-irritant, and safely given in reasonable dosage for any length of time.

The dosage is 2 to 4 tablets (repeated if necessary), to be chewed and swallowed with a drink of water.

TABLETS: in cartons of 40 (rolls of 10 with pocket container)

GLAXO LABORATORIES LIMITED, GREENFORD, MIDDLESEX BYRon 3434

'STREPTAQUAINE'
trade mark brand

SOLUTION

STABILISED INJECTION OF STREPTOMYCIN SULPHATE

is now available in two forms

1

'STREPTAQUAINE' 1 in 4
250,000 units per ml.

2

'STREPTAQUAINE' 1 in 3
330,000 units per ml.

Therapeutically, the products are identical but the choice of concentration provides flexibility to meet individual needs. These convenient ready-prepared solutions cost no more than streptomycin normally available in the dry state.

Packs: Vials containing the equivalent of 1 gramme (boxes of 5) and 5 grammes (boxes of 10) of streptomycin base.

Distributed by :

ALLEN & HANBURYS LTD. BRITISH DRUG HOUSES LTD.
BURROUGHS WELLCOME & CO. EVANS MEDICAL SUPPLIES LTD.
IMPERIAL CHEMICAL (PHARMACEUTICALS) LTD.
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THE DISTILLERS COMPANY
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DEVONSHIRE HOUSE, PICCADILLY, LONDON, W.1

owners of the trade mark 'Streptaquaine'

25/55

PRESFERSUL

TRADE MARK

'Prescoted' Ferrous Sulphate Compound Tablets B.P.C.

Towards reducing the risk of ferrous sulphate poisoning of children

The rising incidence of fatal medicinal poisoning of children during recent years has been much commented upon in the medical press, but not explained. According to a report in *The Practitioner* (June 1954, p.649-654), out of 231 such deaths of British children in the five years 1948—1952, the largest group was due to ferrous sulphate tablets (33 deaths).

The British Medical Journal editorially (Nov. 28, 1953, p.1208) has pointed to the duty of chemists to their customers in this connection, and the authors of a report (in the same journal Feb. 6, 1954, p.335) on one fatal case, hoped that doing so would "strengthen the attempts to force the hand of the manufacturers of 'green sugar-coated ferrous sulphate pills' to do something to alter their fatal (literally) attractiveness to small children". In June of last year the Council of the Pharmaceutical Society adopted a resolution to discourage the production of "gaily-coloured tablets which are a potential danger to children".

In deference to these opinions we have used the new technique of press-coating, devised in the laboratories of Evans Medical, to produce Tab. Ferr. Sulph. Co. B.P.C. with a virtually tasteless white coat which effectively masks the nauseating taste of ferrous sulphate but is no more attractive in appearance than any plain white tablet.

Although fully complying with the standards of the B.P.C. and N.F., the new tablets have been given the trade name PRESFERSUL to distinguish them from other standard tablets prepared by the conventional process. Prescribers should use the name PRESFERSUL if, for reasons of safety, they wish these tablets to be dispensed in preference to other forms of Tab. Ferr. Sulph. Co. Pharmacists are at liberty to dispense PRESFERSUL when Tab. Ferr. Sulp. Co. is prescribed, but will no doubt wish to explain to patients the deliberate reason for the different appearance.

The new press-coating technique has made it possible, by special formulation, to make PRESFERSUL Tablets comply with a maximum disintegration time specification of 15 minutes, a standard which the official publications normally impose only for uncoated tablets.

EVANS MEDICAL

EVANS MEDICAL SUPPLIES LTD. SPEKE, LIVERPOOL 19, & RUISLIP, MIDDX.

574

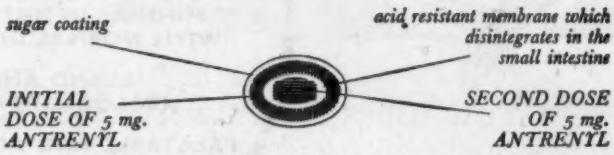
NEW DEVELOPMENT IN ANTICHOLINERGIC THERAPY

Antrenyl

duplex

A SINGLE tablet with TWO PHASES of activity

DIAGRAMMATIC REPRESENTATION


sugar coating
acid resistant membrane which disintegrates in the small intestine
INITIAL DOSE OF 5 mg. ANTRENYL
SECOND DOSE OF 5 mg. ANTRENYL

Two tablets daily provide four spaced doses for the relief of gastro-intestinal pain, particularly nocturnal pain in peptic ulcer

10 mg. Antrenyl 'Duplex' tablets in bottles of 25, 100 and 500

C I B A

'Antrenyl' is a registered trade mark denoting
2-diethylaminoethyl-α-cyclohexyl-α-phenylglycollate methobromide. Reg. user.

CIBA LABORATORIES LIMITED · HORSHAM · SUSSEX

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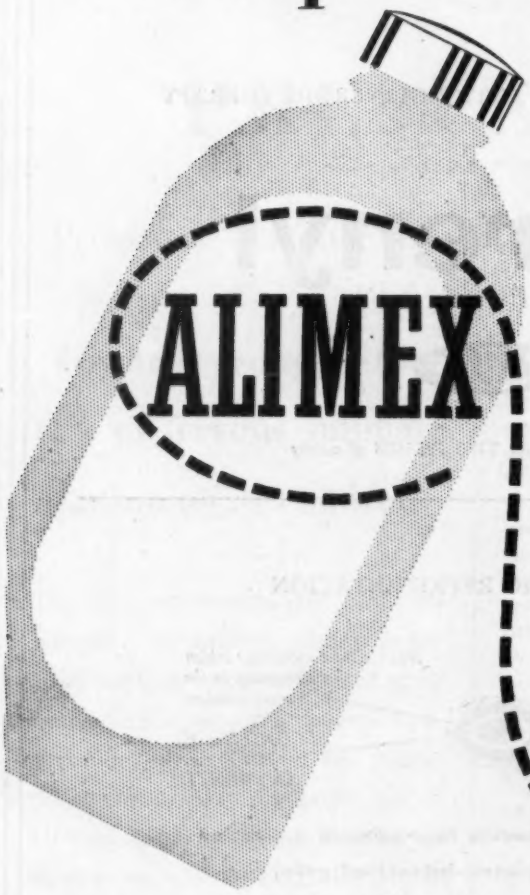
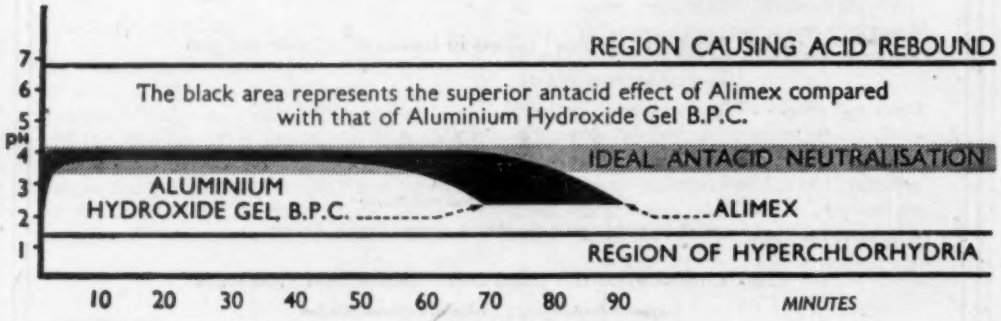
2/5

A unique combination



A unique combination of aluminium and magnesium hydroxides indicated for the prophylaxis and treatment of peptic ulcer and gastric hyperacidity. Clinical experience has shown that Alimex combines these outstanding advantages:

- PROMPT AND SUSTAINED ANTACID ACTION
- MAXIMAL ACID-BINDING EFFECT
- CONTROLLED NEUTRALISING CAPACITY
- MINIMAL INTERFERENCE WITH NORMAL DIGESTION
- BLAND AND NON-CONSTIPATING
- PALATABLE AND ACCEPTABLE FOR PROLONGED ADMINISTRATION



Basic N.H.S. Prices 8 fl. oz. bottle 1/9½, 80 fl. oz. bottle 13/4.

Literature and clinical sample gladly sent on request.

BOOTS PURE DRUG COMPANY LIMITED NOTTINGHAM ENGLAND

S.215

Antihistamines for old and young

When the contents of Pandora's Box were released, Hope alone remained. To the patient of allergic diathesis, threatened by a veritable Pandora's Box of ills, the antihistamines 'Histantin' and 'Actidil' represent far more than hope.

For adults 'Histantin' is the product of choice, giving prolonged relief with a minimum of side-effects.

The new quick-acting antihistamine, 'Actidil', exerts its effect for about 12 hours and is also notable for low incidence of side-effects. 'Actidil' Elixir has been specially formulated and clinically tried for the treatment of allergic conditions in children.

'HISTANTIN', *50 mgm., is issued in bottles of 25, 100 and 500 at list prices (subject to usual discount) of 6/6, 24/6, 110/-.*

'ACTIDIL' *compressed products of 2·5 mgm. in bottles of 25 and 500 at list prices (subject) of 6/6 and 110/-.*

'ACTIDIL' ELIXIR *in bottles of 20 fluid ounces, for dispensing, at a list price (subject) of 15/-.*

BURROUGHS WELLCOME & CO. *(The Wellcome Foundation Ltd.)* **LONDON**

A H

a truly restful night

the tablet that works to a time-table . . .

Outer shell
Pentobarbitone sodium B.P. 90mg.
Action rapid; duration 3 hours

with

Enteric coated inner core
Butobarbitone B.P.C. 60mg.
Action begins after 2½ hours; Duration 5 hours.

Bidormal is an effective hypnotic with a two-phase action. It contains a rapid short-acting barbiturate, together with an intermediate-acting barbiturate that has a carefully timed delayed action. Bidormal thus provides a unique and effective means of maintaining calm uninterrupted sleep throughout a complete night of 8 hours. Its lack of residual hangover, drowsiness or "drugged" feeling enables the patient to set about his daily tasks next morning with no diminution of mental acuity and no feeling of drug dependence.

another new A & H product

BIDORMAL

Supplied in bottles of 25 and 500 tablets.

ALLEN & HANBURYS LTD · LONDON · E·2
TELEPHONE: BISHOPSGATE 3201 (20 LINES). TELEGRAMS: "GREENBURYS, BETH, LONDON"

MENTAL HEALTH DESPITE MENTAL RETARDATION*

A. F. ALFORD
C.B.E., M.B. Brist.
SENIOR MEDICAL OFFICER, MINISTRY OF EDUCATION

MENTAL deficiency is not an illness or a disorder of mind, but rather an arrested or incomplete development of brain, usually from birth, leading to a diminution of intellectual powers relative to the chronological age.† Unfortunately, children who are born with this deficiency of mental powers receive less sympathy and understanding than children who are physically handicapped. Those who suffer from a disability which can be *seen* usually receive warm-hearted pity, even though the nature of the handicap may not be fully appreciated or understood. But those who suffer from a mental retardation rather tend to raise in the public mind a sense of repulsion and even an emotional dislike. This attitude is due, primarily, to a lack of knowledge about these children, as regards both the genesis of their retardation and its effect on their intellectual and emotional well-being; the possibilities of the child developing such powers as he has and becoming a useful citizen are ignored.

This present attitude of so many is greatly to be deplored. For if mental defectives are not received naturally and without bias in the community, but are shunned or treated as outcasts, their mental health suffers, leading frequently to introspective emotional disturbance or to aggressive antisocial behaviour.

The Parents' Feelings

Parents' attitude towards their defective offspring may leave even more to be desired. The parent-child relationship should be the same as in normal families, and yet so often, particularly where the parents are intelligent, it is clouded by a deep sense of guilt, because they imagine that the handicap is their fault, or that they are being punished for past misdeeds.

This sense of guilt is chiefly based on lack of knowledge of the possible causes of mental deficiency. Thirty or forty years ago mental deficiency was thought to be caused entirely by heredity; if a child was mentally defective it was taken as a sign that his parents—or their parents before them—were defective too. Since those days, however, it has become abundantly clear that, though heredity remains a prime factor, there are other causes which produce subnormality. In families of unimpeachable heritage mentally defective children are found. Indeed, in most gatherings of professional and intelligent people there is likely to be at least one family containing a mentally subnormal child. Proof of causation still evades us. Certain postnatal illnesses, such as meningitis, and accidents are readily accepted as causes. But many theories have been advanced which implicate, among other things, endocrine deviations or biochemical reactions in utero, the rhesus factor, and partial asphyxia and cerebral damage during birth. Though none of these theories would explain more than a small fraction of these indeterminable cases, it does bring consolation to parents and removes their sense of guilt to know that their child may be as he is through causes other than heredity.

But, even if this sense of guilt is lessened or removed, parents find it difficult to accept a defective child in the family. The less intelligent parents frequently may not acknowledge the presence of the disability at all. It is not easy, even for intelligent parents, to understand that a child can have a world which is different in any way from their own, that his perspective and outlook cannot be the same as theirs, and that the future does not hold a cure for an innate mental disability. They do not realise that the lower the intelligence the greater the shrinkage of the child's world until, in the lowest grades, the world is the child's immediate environment, the part of a room or garden in which he happens to be at that moment. They are unwilling—subconsciously, if not consciously—to accept that a defect of mind remains throughout life. Thus, false hopes are aroused which, when they are dashed, lead to resentment and even despair.

Such feelings, and the sense of guilt as well, can create a vicious circle. An unnatural barrier is set up between parent and child, which not only prevents a mother experiencing the full joy of motherhood but may also prevent her showing any of the love she feels for her child. This can have a disastrous effect on the emotional development and well-being of the child, whose reaction in turn may loosen the bonds of mother-love to such an extent as to bring about partial or even complete rejection of the child.

The point to be driven home to the public at large, as well as parents, is that every child who is handicapped either in mind or body should be looked upon not as a defective but as a normal child, with a deviation from normality in one particular respect. This positive approach tends to focus attention on potentialities instead of imperfections.

When a child is born who is obviously mentally defective, what should be said to the parents? The parents are keyed up physiologically and emotionally, and such a child is a bitter anticlimax to their hopes and expectations. It is not right to leave them in a state of ignorance for long, for the sooner they realise their misfortune the better they will be able to cope with the problem. If such knowledge is withheld too long, the mental health of the parents, and subsequently of the child, will often suffer more damage, the late repair of which becomes increasingly more difficult—as experience has proved over and over again. But, the information must be given judiciously, tenderly, and with much sympathetic understanding and patience. There is more than one way of saying the same things; care must be taken to use the way which will help the individual most to accept what has happened and to make the best of it.

Later on, if the parents have a sense of guilt or despair and a vicious circle is set up, it may be broken by the family doctor or any other person who is able to approach the problem with wisdom, understanding, and sympathy. He can help the parents to face reality by explaining what they feel as simply as possible, by being willing to listen, and by answering their questions, however indefinite and vague. Once the agitation of the parents' minds has been calmed by the acceptance of the situation, their mental health improves and that at once has a favourable effect on their child.

Education and Self-respect

The variability of intellectual deficiency is infinite. But, whatever the intellectual level, the aim must always be to nurture and develop to the fullest extent in early life the intelligence there is, so as to enable a child to live a life to the limit of his powers and to equip him to

* World Federation for Mental Health: A paper read last August at Toronto before the Fifth International Congress on Mental Health, under the title Some of the Mental Health Aspects of Mental Deficiency.

† Mental deficiency is not defined in the same way in all countries. In England and Wales, since the Education Act of 1944, the term has referred only to those children who, by reason of a mental disability, cannot be educated in schools. Those who can be educated in schools, but need some special help, are classified as *educationally subnormal*, and that is the group with which this paper is solely concerned.

take his place, however lowly, in the world around him, and to make him acceptable to his fellow men.

If an attempt is made to drive a child too far, he will feel frustrated by his failure and may well sink below the level he could otherwise comfortably reach. If a child is not stretched adequately, then he will stagnate and lose his self-esteem and respect. A child who lives fully up to his intellectual capacity has also gone a considerable way toward the contentment and happiness which are the foundation of mental health.

Furthermore, the retarded child must have within him a sense of self-respect, if his mental health is to flourish. Many components, acting in unison, help to instil this self-respect. Uninhibited mother-love and good family relationships, full development of intellectual powers leading to achievements both in thought and action, fostering of independence, belief in and realisation of innate abilities, and, above all, acceptance by others—all exert a tremendous influence on the growth of self-respect. Obscured by mental deficiency, this may appear of little consequence to others, but to the child it is vital and extremely satisfying. It is not brought about by development suddenly or by concrete effort on the part of others. It waxes imperceptibly as the early years pass, chiefly through the external influences and guidance of others, until self-respect prevails. Then lies ahead a life full of promise.

A child can be helped to develop his mental powers to their fullest extent if he is given the right education and training. For this it is essential to have a sound knowledge of the diverse combinations of attributes and of the variations of mental processes in the intellectual make-up of mentally retarded children. This knowledge can only be acquired by experience, based initially on a profound understanding of normal children and of the very wide limits of normality. For, until this has been done, the significance of deviations from normality can neither be fully appreciated nor assessed. Because each child is an individual, there are no easy rules which govern the understanding of these retarded children. Every one must be considered as a separate entity, and his needs met in such a way as to encourage the promotion of his good mental health.

Although a mentally retarded child will in intelligence be well below the average for normal children of the same age, he will have some mental qualities which range themselves above or below his general level. What counts is that he has some qualities above *his* average; the general average does not matter. Further, it is essential to remember that these children do not all possess the same characteristics. Not only do they differ in intelligence, but at each level they also differ in temperament, emotional stability, and, above all, in upbringing and home background. The results of these differences show themselves in uneven development. They do not have poor memories for everything; they remember well only that which they comprehend or which has taken their fancy. They may be able to repeat with ease simple poems or hymns, but be unable to recall anything of a lesson which was over their heads. They can often concentrate well on something which interests them and yet be scatterbrained where academic subjects are concerned. Sometimes, where written work is not required, they may approach closely to the interests and abilities of normal children in, say, handicraft or observation of Nature, in singing or physical movement. There is scarcely one who has not some relatively strong point capable of being utilised by a watchful teacher as a basis for wider and more fruitful progress. It is seldom that there is complete apathy, denying one a starting-point on which to build; but the building is a highly individual process which cannot take place in large groups. If they are to advance, individual methods are needed.

A sense of achievement is of immense importance to these children. Every one of us derives great satisfaction from the accomplishment of a task, and the more difficult it has been the greater will be the satisfaction. In mentally defective children the satisfaction secured through any achievement is always profound and it may be out of all proportion to the nature of the task. It brings with it, as a natural sequence, a sense of mental well-being, the corollary of good mental health. On the other hand, while nothing succeeds like success, nothing is so devastating to the mental health of a defective child as to offer him lessons which are beyond his powers of comprehension. If these are given, frustration, irritability, impatience, and many other manifestations of unsatisfied achievement will show themselves, and these may be the seeds of emotional disturbances or of anti-social behaviour later, which every effort should be made to prevent. Hence, in the field of education teachers should concentrate from the start on the abilities and aptitudes which are above the child's average and should give lessons and tasks which are within the child's compass. This, of course, means that the education must be related more to the level of intelligence than to chronological age.

Social Adjustment

Once action has been taken to secure appropriate education for a mentally subnormal child, results, as a rule, are quickly apparent. They are obtained most rapidly where the change in environment is greatest—for example, when a child is transferred from an ordinary school with large classes, where the teacher has little time for him, to a special school which caters for children of his intellectual level in smaller groups. The first change is usually in behaviour, for most teachers realise that without social training there is likely to be little progress in the more formal aspects of education. They therefore concentrate at first on making the child feel secure, on demonstrating that adults are really interested in him, and on making it clear that they do not judge him only by his success or failure in school work. Children with appalling histories of destructiveness, delinquency, tempers, aggressiveness, or truancy have settled down quickly under a new régime and after the first few weeks have given no trouble at all. After an improvement in conduct comes a blossoming of the personality, often accompanied by improvement in carriage and physique, increased weight, and better complexion. The children become more agreeable to live and work with; they settle down with increased self-confidence and self-respect to tackle their school work and to use their intelligence, meagre though it may be, to the best advantage. The girls can be taught to appreciate and to develop habits of cleanliness and order in the home, whilst the best learn to do some of the duties which fall to the lot of the housewife. Boys usually have some instruction in practical work which sometimes leads on to a skilled craft, but which, in any case, contributes towards the development of general handiness. The great justification for this régime is, however, its success in making these children more socially acceptable and adaptable.

The social training of these children is of immense importance and of far more significance to them than mere educational attainments. The extent to which they are accepted as agreeable individuals by and in a community is directly proportionate to the degree of their social adjustment. A boy who is cheerful, willing, and obedient, and yet perhaps unable to read or write, will be accepted, whereas another who can do both relatively well, will be shunned or disliked on account of his lack of social qualities. This attitude of the community has a direct reaction on the mental health of each boy. The former boy feels that he has fulfilled his main ambition of being somebody in the eyes of

others, thus giving him a sense of citizenship, and above all, of usefulness. The latter boy has a feeling of failure and frustration, or grievance and ill-will against society, all of which breed discontent and unhappiness, leading to emotional difficulties and maladjustment, and perhaps even to delinquency and crime.

In order to inculcate a sense of good mental health in mentally defective children, several fundamental conditions must be fulfilled. The most vital one is that the child must be brought to accept good social standards, principles, and customs through education and training within a suitable environment. Environments shape the individual; everyone can be affected by his environment for good or ill. An unsatisfactory atmosphere produces an unsatisfactory person.

The part that associates and companions play is also of much significance. As the mental powers of a child are reduced, so are diminished his powers of appreciation of right or wrong, or of deciding things for himself. He is easily led, he is swayed readily by others and he is apt to do things without realising their import. He becomes very responsive to the influences, for good or evil, of those around him. If his associates have low moral principles or delinquent propensities their influence on him is corrupting, and he may easily succumb to their wiles and depravities. His own mental health will suffer sooner or later as a result of discredit and disgrace, leading to a declining self-esteem. On the other hand, if his companions are honest and of good character he will respond just as readily. Through spending his time in a good atmosphere his mental health will profit. Every effort, therefore, should be made to ensure that, so far as is possible, these children are shielded from unsavoury associates.

Employment and Contentment

After education or training has ended, employment has a direct bearing on the mental well-being of these children. They have an urge to be like others, to be able to do things and, above all, to have a job which earns them money. Suitable employment is not always easy to obtain, but when it is found to fit a young person, his satisfaction is very real, and he feels that he has proved his worth, his independence, and his usefulness. Lack of intelligence is not by any means a bar to gainful employment. In many of the unskilled and semi-skilled occupations of modern life, what counts in obtaining and retaining a job is not so much specific skill, literacy, or information, as steadiness, reliability, honesty, and the ability to get on well with workmates and the foreman—in fact, qualities of character and social development which can be acquired even by those of poor intelligence if they are well taught and are not discouraged by being forced to attempt what is beyond them. Because of their mental deficiency, discontent or dissatisfaction about the relative lowliness of a job or the poorness of the pay does not arise. He does not mind incessant repetition of the same action or activity; it is something which has to be done by someone and *he* can do it. But if he is to enjoy his work to the full, others around him must be aware of his limitations and must be willing to be tolerant, kind, and understanding.

To sum up, the ultimate aim with these children should be to make them happy and contented. The starting-point is to regard them as normal children with an intellectual deviation. They can be helped by social training and education to live a full life within their limitations, giving them a sense of satisfaction, worth, and usefulness. With happiness will come mental health; and a child who has good mental health, even if he is mentally defective, is an asset to the community and therefore to the country. It is a challenge to everyone to help all mentally defective children to achieve the mental health which is the birthright of every human being.

GLUTAMIC ACID IN HEPATIC COMA

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RECENT research into the biochemistry of hepatic coma has directed attention particularly to disturbances of nitrogen metabolism.

Previously I have pointed out (Walshe 1951) how disturbed metabolism of amino-acids might inhibit the metabolism of glutamic acid in the brain, leading to accumulation of intracellular ammonia.

Other workers have studied blood-"ammonia" levels in hepatic coma (Schwartz et al. 1953, Traeger et al. 1954, McDermott and Adams 1954, Bessman et al. 1954, Singh et al. 1954, Riddell and McDermott 1954, Sherlock et al. 1954). Analysis of the published results shows great discrepancies in the values given for normal blood-"ammonia" levels in the different groups; and, though the blood-"ammonia" level is usually raised in patients in hepatic coma or pre-coma, there is no more than a fair correlation between this and the state of consciousness. It has been established, however, that ammonium salts and ammonium ion-exchange resins, when given to patients with advanced hepatic cirrhosis, may produce a syndrome closely mimicking hepatic coma (Van Caulaert et al. 1933, Fuld 1933, Gabuzda et al. 1952), and intravenous ammonium chloride will produce convulsions in rabbits—an action prevented by glutamic acid (Sapirstein 1943).

In a preliminary communication I described the results obtained with large doses of glutamic acid given either intravenously or by mouth to patients in hepatic coma resulting from chronic liver diseases (Walshe 1953). Five episodes of coma in 3 patients were treated with glutamic acid, and the results were sufficiently encouraging to merit further study.

Subsequent reports on the use of glutamic acid in hepatic coma have been conflicting. Some workers confirm the beneficial action in patients with chronic liver disease (Priest et al. 1953, Whitehead et al. 1954, Riddell and McDermott 1954, Walley 1954, H. Blalock jun., personal communication), whereas others have not been convinced of any benefit (Singh et al. 1954, Davidson 1954, Sherlock et al. 1954). There appears to be general agreement that, in the coma of acute hepatic necrosis, glutamic acid does not alter the course of the illness (Calvert et al. 1954, Whitehead et al. 1954, Riddell and McDermott 1954).

Since my preliminary communication in 1953 a further episode of coma in 1 of the original cases and episodes of coma in 4 further cases of hepatic cirrhosis and in 2 cases of massive hepatic necrosis have been treated with glutamic acid in this hospital. Glutamic acid appears to influence favourably the coma of hepatic cirrhosis but not that of massive hepatic cirrhosis.

Case-reports

HEPATIC CIRRHOSIS

Case 1.—A man, aged 69, who admitted to considerable spirit-drinking over many years, complained of losing weight for six months and increasing jaundice for one month. There were no associated constitutional disturbances.

On examination he was deeply jaundiced, his spleen was impalpable, and his liver dullness was much reduced to percussion; but fœtor hepaticus was present. The protein-flocculation tests were strongly positive, and the serum-albumin level had fallen to 3·0 g. per 100 ml. The prothrombin concentration was too low to allow needle biopsy of the liver to be done with safety.

Treatment and course.—With rest in bed and adequate diet the patient's condition improved considerably and he left hospital almost anicteric after a stay of ten weeks. Three months later he was deeply jaundiced and mentally confused; ascites was present, he was extremely drowsy, and his tendon-jerks were very brisk, but he had no ankle clonus and the

plantar responses were flexor. Oral glutamic acid 20 g. daily was started, and this coincided with a rapid improvement in his mental condition. After three days glutamic acid was withdrawn, and within twelve hours he became confused and incontinent of urine. Glutamic acid was restarted by mouth, and in the next forty-eight hours he returned to normal consciousness. Withdrawal of glutamic acid was again followed by coma within twenty-four hours, with increased muscle tonus in the legs and bilateral extensor plantar responses. A slow intravenous infusion of sodium glutamate was started, 17 g. being given over eight hours. At the end of this time the patient was conscious and could answer simple questions, and the plantar responses had reverted to flexor. Maintenance doses of oral glutamic acid were given, but despite this he returned through confusion to coma during the next five days. After three days' coma he was given intravenous sodium glutamate 46 g. in twenty-four hours; at the end of this time he could answer simple questions but was drowsy and resented interference. No glutamic acid was given after this, and the patient lapsed into coma and died three days later.

Necropsy revealed advanced diffuse fibrosis of the liver, which weighed only 840 g.

Case 2.—A man, aged 56, had been in good health until a year before admission, when he began to feel vaguely unwell and lost his appetite. After eight months he had a large hæmatemesis, which necessitated admission to his local hospital, where he was transfused and hepatic cirrhosis was diagnosed. After his return to work he became jaundiced and noted swelling of his legs and abdomen. There was a history of considerable drinking of beer and spirits during the war years.

On admission to University College Hospital he was mildly icteric and had multiple vascular spider nævi, ascites, œdema of the ankles, and fœtor hepaticus. There were no abnormal signs in the central nervous system (C.N.S.).

Treatment and course.—A fortnight after admission he had a very large hæmatemesis and, despite a transfusion of 6 pints of blood, passed into deep coma, with knee and ankle clonus and bilateral extensor plantar responses. There was then gross amino-aciduria. After twenty-four hours in deep coma his condition was deteriorating and he was therefore given sodium glutamate 35 g. intravenously in twenty-four hours. Consciousness was returning by the end of this time and was normal after a further twenty-four hours. A month later he had another very large hæmatemesis and died before treatment could be started.

Necropsy showed that his liver was deeply scarred by dense bands of fibrous tissue and weighed 1200 g.

Case 3.—A man, aged 38, had been in good health until four years previously, when his abdomen and legs began to swell. He was admitted to hospital, and hepatic cirrhosis was diagnosed. His symptoms cleared completely after treatment by rest in bed and a high-protein diet. He remained well for four years until December, 1953, when he was admitted to University College Hospital after having a hæmatemesis. He was found to have hepatic fibrosis and portal hypertension. While in hospital he had two further hæmatemeses on consecutive days and, despite adequate blood replacement, became comatose. He had a strong fœtor hepaticus.

Treatment and course.—After a day in coma he was given sodium glutamate 23 g. in eight hours, and four hours later he had regained consciousness and was mentally alert and rational. The following week he was sufficiently well to have an operation for splenectomy and lienorenal shunt. He remained in good health for six months, at the end of which he had yet another hæmatemesis followed by the development of a precomatose state and a raised blood-"ammonia" level (175 μg. per 100 ml.). His condition improved with glutamate therapy, and the blood-"ammonia" level returned almost to normal (75 μg. per 100 ml.). Later there was an episode of severe rectal bleeding, from which he died.

Necropsy revealed thrombosis of his lienorenal shunt and his superior mesenteric vein, and infarction of much of his small bowel.

Case 4.—A woman, aged 39, had had an illness with abdominal pain and jaundice six years before she was first seen in University College Hospital. Two years after her first symptoms she developed ascites and œdema. The diagnosis of cirrhosis of the liver was confirmed by needle biopsy. At first the retention of fluids was controlled by ion-exchange resins and a low-salt diet, but later paracentesis abdominis had to be resorted to with increasing frequency. In August, 1954, forty-eight hours after a routine tapping, she became drowsy, complained of severe anorexia and headache, and developed a severe irregular tremor of her hands, with ankle clonus and bilateral extensor plantar responses. Fœtor hepaticus was not detected. Hepatic coma appearing imminent, she was given sodium glutamate 23 g. by mouth in the next two hours. Next morning (ten hours later) she was alert and had lost her abnormal neurological signs. This improvement was not well maintained, and a maintenance dose of sodium glutamate 23 g. by mouth daily became necessary. However, after a further four days the abnormal neurological signs returned and she became comatose. Sodium glutamate 30 g. was given intravenously, and she became rousable and able to answer simple questions. Treatment was discontinued because it was now clear that it could produce no lasting benefit, and the patient died thirty-six hours later in deep coma. Necropsy was refused.

Case 5.—A man, aged 46 (case 1 of Walshe 1953), who also had chronic ulcerative colitis, had already had one episode of hepatic coma treated with sodium glutamate in 1952. Since that time he had kept in fair health until January, 1954, when, after an exacerbation of his colitis, he had a severe rectal hæmorrhage; he was admitted to hospital precomatose, with fœtor hepaticus and other signs of hepatic failure. Immediately after admission he was given a 3-pint blood-transfusion, but his condition continued to deteriorate, and he became comatose. During the next twenty-four hours he was given sodium glutamate 46 g. by slow intravenous infusion, and he had fully regained consciousness by the end of this time. He has remained in fair health during the following 9 months.

Case 6.—A woman, aged 30, was admitted in deep coma. She had apparently been unwell with nausea and vomiting for a month and had been jaundiced for two weeks. She had been in coma for about seventy-two hours before her admission. She was deeply jaundiced, her liver dullness was reduced, her pupils were dilated, she was very restless, and ankle clonus and plantar responses were present. Treatment was directed to maintaining the fluid and electrolyte balances, and calories were supplied with 25% glucose solution; sodium glutamate 23 g. was given daily. There was no response to treatment, and the patient died on the third day.

At necropsy the liver was found to be severely necrotic; it weighed 800 g.

Case 7.—A woman, aged 45, with hepatic necrosis and fœtor hepaticus, was admitted in February, 1954. During the next ten days very careful control was kept of the fluid and electrolyte balance, calories were supplied by 25% glucose drip into the superior vena cava, and sodium glutamate 23 g. was given daily. After the first 23 g. of glutamate she could answer simple questions, but this improvement was not maintained, and there was no further apparent response to treatment before her death. For further details see Challenger and Walshe (1955b).

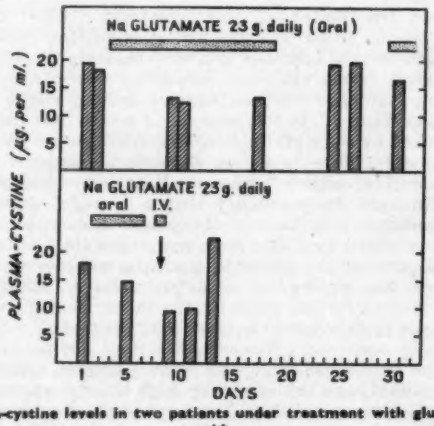
Summary.—4 new patients with chronic liver disease were treated with sodium glutamate,* either by mouth or intravenously, each for one or more episodes of hepatic coma or pre-coma. 2 of them responded well: 1 of these left hospital in fair health to die later of mesenteric thrombosis, and the other had a good initial response but died later of hæmorrhage from œsophageal varices. The remaining 2 responded briefly only to die later of progressive liver failure. 1 of the 3 patients reported earlier (Walshe 1953) was treated in a second episode of coma and again responded. 2 cases of massive hepatic necrosis did not respond to treatment with glutamic acid.

Special Investigations

Metabolism of Amino-acids

The metabolism of amino-acids was studied by paper chromatography in 2 cases of hepatic cirrhosis and in both cases of massive hepatic necrosis. In both cases of cirrhosis detailed studies showed a definite abnormality of the pattern of amino-acids in the plasma during coma,

* When given intravenously either the monosodium salt of L (+) glutamic acid or a mixture of the sodium and potassium salts in the ratio 3 : 1 was used. When given orally either glutamic acid tablets 0·5 or a solution of monosodium glutamate was given in divided doses throughout the twenty-four hours.



Plasma-cystine levels in two patients under treatment with glutamic acid.

the most notable finding being the very high plasma-methionine level. In the 2 cases of acute hepatic necrosis the raised levels and disturbed pattern of the amino-acids in the blood were more striking; here again the raised blood-methionine level was the outstanding finding. Glucosamine was also detected in the plasma of one of these 2 patients. In 1 of these cases the cerebrospinal fluid (C.S.F.) showed very high levels of glutamine, methionine, and an unidentified ninhydrin colour reactor, possibly γ-aminobutyric acid. Excess of tyrosine, phenylalanine, glutamic acid, and methionine sulphoxide was also detected.

The C.S.F.-glutamine level has been studied in more detail by the method of Whitehead and Whittaker (1955). In 15 healthy people it ranged from 6 to 16 mg. per 100 ml. (mean 10 mg. per 100 ml.). A patient with cirrhosis but not in coma had a C.S.F.-glutamine level of 12·7 mg. per 100 ml.; and another, who later became comatose, 27 mg. per 100 ml. Of 3 patients studied while in coma 1 had a C.S.F.-glutamine level of 40 mg. per 100 ml. on oral glutamic acid, and 41 mg. per 100 ml. after this was discontinued; another had 41·5 mg. per 100 ml. before treatment and 44·5 mg. per 100 ml. while on intravenous glutamate; and the 3rd had 45 mg. per 100 ml. These results confirm the chromatographic findings of a very high C.S.F.-glutamine level in hepatic coma but suggest that glutamic-acid therapy does not raise this level still further.

The metabolism of cystine and cysteine has been studied by polarography. The plasma-cystine level is often raised in severe chronic liver disease (Walshe and Senior 1955). In view of Christensen's (1949) finding that large doses of oral glutamic acid depress the level of other plasma-amino-acids in dogs the plasma-cystine levels were studied in 2 patients, and the results (see figure) suggest that the plasma-cystine level may be depressed by large doses of glutamic acid. The normal plasma-cystine level, estimated by this method, is 6–14 μg. per 100 ml. with a mean of 10·64 μg. per 100 ml. (Dent et al. 1954), and the figure shows that this range was much exceeded in both cases studied.

TABLE I—BLOOD-LEVELS OF KETO-ACIDS IN HEALTHY PEOPLE AND PATIENTS WITH CHRONIC LIVER DISEASE

	α-Keto-glutaric acid (μg. per 100 g.)		Pyruvic acid (μg. per 100 g.)		Aceto-acetic acid (μg. per 100 g.)	
	Range	Mean	Range	Mean	Range	Mean
16 healthy people	86–302	143	160–380	230	91–300	161
5 cirrhotics ..	147–187	164	270–342	317	141–367	238

Metabolism of Keto-acids

Disturbed metabolism of keto-acids has been described in patients with liver disease (Amatuzio and Nesbitt 1950, Seligson et al. 1952, Amatuzio et al. 1952, Smith et al. 1953). α-Ketoglutaric acid links the metabolism of amino-acids with that of carbohydrates: glutamic acid ⇌ α-ketoglutaric acid + ammonia (Weil-Malherbe 1936); either disturbances of intermediary carbohydrate metabolism or a failure of the ammonia-binding action of glutamic acid might be reflected by a rise in the concentration of this keto-acid.

By the method of El Hawary and Thompson (1953) the levels of α-ketoglutaric acid, pyruvic acid, and aceto-acetic acid were determined in healthy people, in patients with chronic liver disease, and in patients in hepatic coma. The results for the healthy people and the patients with chronic liver disease are given in table I. It can be seen that whereas the average values for the patients with liver damage are higher than those of the healthy people, they remain within the range of normal variation. The normal values given here agree well with those published by El Hawary and Thompson (1953) so far as the ketoglutarate and aceto-acetate are concerned, but those for pyruvate are somewhat lower, possibly owing to decomposition of this unstable compound during the lengthy process of extraction. Oral doses of glutamic acid 10 g. did not alter the blood-ketoglutarate level in healthy people, nor did a rapid intravenous infusion of sodium glutamate 12 g. much affect this: fasting plasma-ketoglutarate 106 μg. per 100 g.; after intravenous glutamate 125 μg. per 100 g. There was also no significant change in the levels of the other keto-acids. This rapid glutamate infusion was much better tolerated by healthy persons than by patients with severe liver disease, who may retch and salivate if the infusion is given too fast.

TABLE II—BLOOD-LEVELS OF KETO-ACIDS IN HEPATIC COMA IN A PATIENT WITH POST-HEPATITIS CIRRHOSIS

Specimen no.	α-Keto-glutarate (μg. per 100 g.)	Pyru-vate (μg. per 100 g.)	Aceto-acetate (μg. per 100 g.)	Therapy and C.N.S. signs
1	300	583	426	No therapy, precomatose state
2	314	720	635	8 hr. after oral glutamate, normal C.N.S.
3	364	350	445	2 hr. after glutamate, normal C.N.S.
4	437	537	314	No therapy, terminal coma

TABLE III—BLOOD-LEVELS OF KETO-ACIDS IN HEPATIC COMA IN A PATIENT WITH MASSIVE HEPATIC NECROSIS

Specimen no.	α-Keto-glutarate (μg. per 100 g.)	Pyru-vate (μg. per 100 g.)	Aceto-acetate (μg. per 100 g.)	Therapy and C.N.S. signs
1	125	358	322	No therapy, in coma
2	234	485	368	On I.V. glutamate and glucose, coma
3	281	870	2420	On I.V. glucose only, terminal coma

2 patients in hepatic coma were studied. The 1st (case 4) had post-hepatitis cirrhosis (table II).

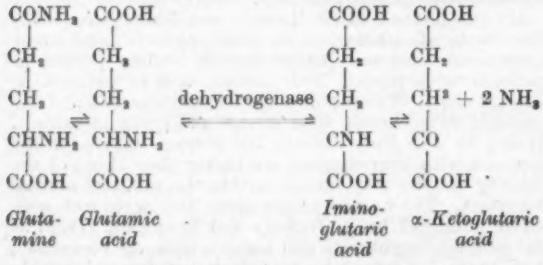
The 2nd patient studied in hepatic coma was case 6, with massive hepatic necrosis (table III).

A single specimen of blood was obtained from a patient who had been in coma for more than a week after thrombosis of his portal and collateral veins; he was receiving 10% glucose intravenously at the time. The blood-ketoglutarate level was 338 μg. per 100 ml., the pyruvate 1620 μg. per 100 ml., and the aceto-acetate 455 μg. per 100 ml.†

† Markees (1954) suggests that the spot identified by El Hawary and Thompson (1953) as aceto-acetate may in fact be "pyruvate spot B," resulting from an isomer of pyruvic acid.

Discussion

The present cases further support the theory that large doses of glutamic acid are sometimes of value in the treatment of coma in patients with hepatic cirrhosis. The rôle of glutamic acid in the metabolism of the brain has been reviewed and discussed by Weil-Malherbe (1952). Enzyme systems are present in the brain for the amidation, transamination, decarboxylation, and oxidation of glutamic acid. In the ammonia-binding mechanism glutamic acid probably enters the following reactions:



Glutamine *Glutamic acid* *Iminoglutaric acid* *α-Ketoglutaric acid*

Thus an excess of intracellular ammonia will lead to a shift to the left in these reactions, with a consequent reduction in the supply of 4-carbon acids for the citric-acid cycle. This in turn would give rise to a switch in pyruvate metabolism to the formation of aceto-acetate. The necessary supply of ketoglutarate could be maintained by pyruvate and oxalo-acetate accepting amino groups from glutamic acid, thereby permitting normal functions of both the Krebs cycle and the ammonia-binding mechanism. The high concentration of glutamic-acid decarboxylase in the brain probably mediates the reaction: glutamic acid $\rightleftharpoons$ α-aminobutyric acid + CO_2. The escape of the resultant CO_2 would lead to a reduction in acidity and the freeing of fixed base. Finally, glutamic acid carries the K^+ ion into the cell, probably as the preferential cation associated with the glutamic-acid anion (Terner et al. 1950).

All the more recent workers in this field have assumed, without further evidence, that the importance of glutamic acid in hepatic coma lies in its key rôle in the ammonia-binding mechanism. Riddell and McDermott (1954) show that, in patients in hepatic coma, the blood-"ammonia" level fell after the intravenous infusion of glutamic acid; a temporary fall was observed by Sherlock et al. (1954); and the diagrams of Singh et al. (1954) also appear to illustrate this, although these workers interpret their results otherwise. The present biochemical studies throw no further light on the underlying metabolic disturbances. No consistent changes were found in the blood-levels of the amino-acids, although the blood-methionine level was often raised. The metabolism of keto-acids also appeared to be disturbed, but intravenous glutamic acid did not much raise the blood-ketoglutarate levels; nor did the blood-level of aceto-acetate rise consistently as might have been expected if the supply of 4-carbon acids for the citric-acid cycle had been reduced seriously by a disturbance of the ketoglutarate $\rightleftharpoons$ iminoglutarate equilibrium in favour of the latter (cf. Weil-Malherbe 1952). Moreover other factors, such as starvation and glucose loading, must have played a part in the high blood-levels of aceto-acetate and pyruvate which were found on occasions. Bessman and Bessman (1954) believe that the toxic action of ammonia is the removal of ketoglutarate from the Krebs cycle, but they did not allow for the replacement from glutamic acid by the transamination reaction described by Weil-Malherbe (1952).

In all the present cases where it was estimated the C.S.F.-glutamine level was raised to approximately the intracellular level of glutamine but was not raised further by glutamic-acid therapy, a finding which has also been reported by Whitehead and Whittaker (1955). This could be due either to a leakage of glutamine from the damaged cortical neurones or a compensatory mechanism to remove excess ammonia bound by the intracellular enzyme systems. Such an enzyme system might then become exhausted, in the presence of severe liver disease, or blocked by some glutamic-acid antimetabolite (Walshe 1951), and failure to detect consistent changes in the blood-level of either "ammonia" or keto-acids would not eliminate the possibility that a deranged ammonia metabolism is important in the genesis of hepatic coma. The undoubted fact that both oral ammonium salts and a high-protein diet given to patients with severe liver damage can produce a syndrome closely mimicking hepatic coma further supports the theory that disturbed ammonia metabolism is in some way connected with the naturally occurring syndrome, but does not mean that it is the only cause of hepatic coma. Indeed, Seegmiller et al. (1954) have achieved very high blood-"ammonia" levels (1·8 mg. per 100 ml.) without producing abnormal neurological signs, and Benitez et al. (1954) note that the direct application of ammonium salts to the cortex did not give rise to altered cortical electrical activity, but they did find that the brain-ammonia level rose in fluoro-acetate poisoning without a corresponding rise in the blood-ammonia level. Under the experimental conditions the cerebral ammonia was not readily converted to glutamine. It has also been shown that the brain-ammonia level rises after electrically and chemically induced convulsions and in anoxia (Waelsch 1951). In severe hepatic disease, therefore, when the ammonia-binding mechanism remains intact, a relatively high blood-ammonia level could, at least in theory, be well tolerated, whereas in cases where some inhibiting factor was present a normal or only slightly raised blood-ammonia level might exist coincidentally with a toxic level in the cortical neurones. This could account for the conflicting evidence reported by many workers on the correlation of neurological signs with the blood-ammonia levels. It should perhaps be mentioned at this stage that the assumption that ammonia, in the concentrations reported, has a direct toxic action on the brain is not entirely supported by the available experimental evidence; for, apart from the work of Benitez et al. (1954), Terner et al. (1950) found that, although 0·005 *M* ammonia, a concentration many times greater than that found in hepatic coma, caused a fall in the tissue-potassium level it did not inhibit the uptake of oxygen by brain slices. Similarly, it has been reported by Edson (1935) that the metabolism of brain slices in a glucose medium is not inhibited by a 0·01 *M* concentration of NH_4Cl, a concentration which will reduce the respiration of the liver by 20%.

It is not generally realised that the administration of methionine to patients with advanced liver disease may be followed by coma. This was first noted by Watson (1949), and more recently by Sherlock et al. (1954) studying the toxic effects of nitrogenous compounds in patients with portal hypertension. The possible mechanisms are discussed by Challenger and Walshe (1955a and b).

In an organ mediating as many complex metabolic pathways as does the liver it is unlikely that any single cause underlies all cases of hepatic coma. In acute hepatic necrosis there is, in addition to a disturbed or destroyed hepatic function, the element of intoxication from the rapid necrosis and autolysis of hepatic parenchymal cells. In hepatic cirrhosis two factors need consideration: (1) in many cases there is a progressive loss of liver cells together with impaired function of the survivors, which must inevitably lead to a stage at which the liver can no longer support life; in chronic alcoholics, moreover, the picture is further complicated by damage to the nervous system by multiple enzyme deficiencies;

and (2) in cases with chronic liver damage some precipitating factor, such as hæmorrhage, will precede the onset of coma, and it is in these cases only that therapy can hope to produce a temporary recovery; it is in this group that glutamic acid may prove of value.

Summary and Conclusions

The results obtained with intravenous sodium (or sodium and potassium) glutamate in the treatment of hepatic coma are reported. 5 patients with chronic liver disease were each treated for one or more episodes of coma: 3 responded favourably, but 1 died shortly after of massive gastro-intestinal bleeding; and 2 responded only partially and died later of progressive hepatic failure.

2 cases of massive hepatic necrosis showed no response to treatment.

The rôle of ammonia in the pathogenesis of hepatic coma is discussed. The integrity of the intracellular ammonia-binding mechanisms is probably more important than the plasma-ammonia level. A high blood-ammonia level may be well tolerated in those cases of liver disease in which the ammonia-binding mechanism remains intact, and disturbances of this function may lead to the development of coma even before the blood-ammonia level rises.

Certain disturbances of sulphur metabolism in hepatic coma are described. Large oral doses of methionine may precipitate coma. Some possible toxic actions of methionine and closely allied compounds, referred to by Challenger and Walshe (1955b), are described.

There is probably no single cause of hepatic coma common to all cases, and it would probably be more accurate to refer to "the hepatic comas."

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FŒTOR HEPATICUS

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THE breath of patients with severe parenchymal liver disease often has a characteristic odour, fœtor hepaticus, which has been described as "a musty smell" (Schiff 1946), "the smell of a freshly opened corpse" (Himsworth 1947), and "a mixture of rotten eggs and garlic" (Davidson 1949). The smell may be only just detectable or so strong as to fill the room and has been considered to be due to indol or to an amine (Lichtman 1949).

Attempts to isolate from the breath the compound producing the fœtor have failed because of the very small quantities involved and the difficulty of getting a seriously ill patient to breathe against the resistance of a collecting system. From the smell Davidson believed it to be a mercaptan, possibly derived from methionine or from cystine but not necessarily dependent on methionine therapy.

In patients with a strong oral fœtor a very similar smell may be present in the urine. Butt and Mason (1954) believed that the compound producing fœtor hepaticus was also present in normal urine, and from 75 gallons of normal urine they isolated 6 mg. of a compound which they believed to be a cyclic amine with nitrogen in the ring. This was lost during recrystallisation, and a further extraction of 100 gallons of normal urine gave no significant yield.

We have studied the urine of a patient with massive hepatic necrosis and a strong fœtor in her breath and urine.

Case-report

A housewife, aged 45, was admitted to University College Hospital with jaundice and in light coma. Her illness had started six weeks previously (in December, 1953) with anorexia, diarrhœa, and nausea; after a few days she became jaundiced but did not take to her bed, and after a short illness she appeared to recover. A month later jaundice returned, this time with severe vomiting and prostration. She was admitted in February, 1954, to another hospital and treated with aureomycin for infective hepatitis; but her condition continued to deteriorate, fœtor hepaticus was noted, and she became delirious and lapsed into coma with extensor plantar responses and ankle clonus. At this stage she was transferred to University College Hospital. Her course was progressively downhill and she died nine days later despite treatment with 25% glucose intravenously, careful control of fluid and electrolyte balance, and intravenous sodium glutamate. No amino-acid supplements were given. During this time her urine had a strong fœtor similar to that in the breath but rather more offensive; this was present as soon as the urine was passed and was not due to infection or to decomposition on standing. Paper-chromatographic study of the plasma showed a moderate generalised increase of all amino-acids commonly present and a great increase of methionine.

Necropsy (Dr. R. A. B. Drury) showed extensive necrosis of the liver, which weighed only 840 g., this reduction being due to almost complete destruction of the parenchymal cells.

Examination of urine.—The smell of the urine suggested that the compound responsible was either an alkyl mercaptan, $C_nH_{2n+1}SH$, an alkyl sulphide, $(C_nH_{2n+1})_2S$, or a dialkyl disulphide, $C_nH_{2n+1}S.S.C_nH_{2n+1}$, or possibly all three. We tried to isolate the responsible compound by bubbling a slow stream of nitrogen through 5 or 6 litres of urine, next through dilute sulphuric acid (to remove ammonia), next through dilute mercuric cyanide, and next through dilute mercuric chloride—a method evolved by Challenger and Rawlings (1937) and Blackburn and Challenger (1938). Details of the experimental procedure and the evidence for the

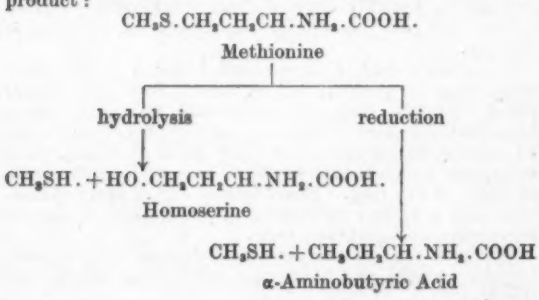
chemical identification of the compounds isolated from the urine of this patient are described elsewhere (Challenger and Walshe 1955). The evidence obtained by this procedure showed that the urine contained methyl mercaptan (CH_3SH) as the principal compound producing the smell, and a smaller amount of dimethyl disulphide ($CH_3S{:}SCH_3$), which may have resulted from oxidation of the methyl mercaptan after the urine was passed; there was no evidence for the presence of dimethyl sulphide in the urine.

Discussion

The finding of methyl mercaptan, and probably dimethyl disulphide in smaller amounts, in the urine of this patient posed three questions: (1) what was the source of the methyl mercaptan; (2) what relation, if any, did this have to the oral fœtor; and (3) what was the metabolic significance of this finding?

Source of Methyl Mercaptan

Like so many patients with severe liver disease, the patient had a very high plasma-methionine level, which fact suggests that the mercaptan may have arisen by either hydrolytic or reductive fission of the sulphur-carbon bond in the methionine, giving rise to homoserine or α-aminobutyric acid respectively as the second product:



Such a fission, with the liberation of methyl mercaptan from methionine and S-methylcysteine, is brought about by the mould *Scopulariopsis brevicaulis* (Challenger and Charlton 1947). The enzyme thionase occurring in liver (Binkley 1950), liberates methyl mercaptan from S-methyl-cysteine, $CH_3.S.CH_2.CH.NH_2.COOH$. Its behaviour with methionine is not recorded. Canellakis and Tarver (1953) report the formation of methyl mercaptan from methionine by rat-liver mitochondria.

Normally the fate of methionine in the body, apart from being incorporated into protein, is to act as a source of cysteine and of labile methyl groups for the biological synthesis of choline, adrenaline, creatine, carnosine, and N-methyl-nicotinamide. Probably many of these trans-methylations occur in the liver and in cases of severe hepatic disease may be inhibited, with a consequent accumulation of methionine in the plasma, as happened in this patient. Fission of the sulphur-carbon link, with the formation of methyl mercaptan, may then be used as an alternative pathway to deal with the excess of methionine. Evidence for this fission has also been obtained by Dent (1947), who found in healthy people and, especially, in a case of the Fanconi syndrome with hepatic cirrhosis an increased excretion of α-amino-butyric acid after the administration of methionine, "as if direct desulphurisation had taken place."

Relation to Oral Fœtor

In considering the relation of the methyl mercaptan in the urine to the oral fœtor it should be pointed out that this compound has a more offensive smell than is commonly associated with classical fœtor hepaticus. Moreover, methyl mercaptan is relatively soluble, and the urine would be the natural route of its excretion. However, dimethyl disulphide and methyl sulphide have an odour very like the sweetish oral fœtor. Since the smell of these compounds can be detected in a dilution of 10^{-7}, it can easily be realised how difficult it would be to identify chemically such substances in the breath. Moreover, if methyl mercaptan is present in the body, it is more than likely that at least a small proportion would be either methylated to dimethyl sulphide or oxidised to the disulphide. The odour of garlic, which has been likened to that of fœtor hepaticus, is due to diallyl disulphide $(CH_2{:}CH.CH_2.S{-})_2$. Probably the smell of fœtor hepaticus is due to a mixture of dimethyl disulphide, dimethyl sulphide, and methyl mercaptan; possibly the proportions of each may vary in different patients, explaining the differences in smell described by various observers.

Metabolic Significance

Finally, are these findings of metabolic significance or of purely academic interest? The finding of thiol groups in the urine appears most surprising in view of the speed with which cysteine is oxidised to cystine in the blood. It is perhaps a comparable finding to that of Walshe and Senior (1955) that patients with severe liver disease cannot clear the blood of cysteine as fast as can healthy people. The failure to convert the mercaptan to detectable amounts of dimethyl sulphide also points to severe impairment of methylation in the liver.

The inability of the patient to metabolise methionine at the normal rate may also be of significance. Earle et al. (1942) showed that, when more than 6% of methionine is added to a low-protein diet rats develop liver atrophy with a high mortality in one week. Hepatic coma has also developed in patients with severe liver damage when methionine has been given (Watson 1949, Sherlock et al. 1954). This action of methionine has been attributed to the amino-group, but the evidence is not entirely convincing. Methionine itself is not necessarily toxic, but perhaps some related intermediate metabolite may also accumulate. Methionine sulphoxide is a glutamic acid antimetabolite to *Lactobacillus arabinosus* (Waelsch et al. 1946, Borek et al. 1946) and so, theoretically, could inhibit the utilisation of glutamic acid in the brain. Methionine sulphoximine, the toxic factor of agenised flour, produces fits in dogs, an action that may be reversed by glutamine (Bentley et al. 1950, Heathcote and Pace 1950), a compound which it resembles structurally. Is methyl mercaptan itself toxic? We have been unable to find any evidence on this in published reports, but analogy with two closely related compounds suggests that it may well be so; there is clearly a close structural and chemical relationship between methyl mercaptan (CH_3SH) and hydrogen sulphide (HSH) and methyl alcohol (CH_3OH). Hydrogen sulphide, in comparable concentrations, is as toxic as cyanide and interferes with the cytochrome system, and methyl alcohol is, as is well known, poisonous to the central nervous system. Roberts and Eckstein (1944) have found that dimethyl disulphide is toxic to rats in a dose of 90 mg. per kg. of body-weight and then appears to yield methyl mercaptan. There is no information about dimethyl sulphide, but this compound is a thio-ether and so may well be toxic also.

Summary

Methyl mercaptan was isolated from the urine of a patient with massive hepatic necrosis; some dimethyl disulphide was probably also present.

It might be expected that, in the body, methyl mercaptan would be either oxidised to dimethyl disulphide or methylated to dimethyl sulphide.

We believe that fœtor hepaticus is caused by the elimination of one or more of these compounds in the breath.

Little is known of the pharmacology of these compounds, but by analogy with closely related compounds they may well be toxic.

We wish to thank Prof. M. L. Rosenheim for permission to study this patient; F. C. thanks Prof. W. Bradley for the hospitality of his department; and J. M. W. is indebted to the Royal Society for a whole-time grant, the Stothert research fellowship.

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THE TREATMENT OF ECLAMPSIA (IMMINENT OR ACTUAL) BY CONTINUOUS CONDUCTION ANALGESIA

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IN 1947 a method of treating eclampsia by continuous conduction block was described by Hingson et al. This followed the observations of Sarnoff and Farr (1944) that a single-dose spinal block was beneficial in hypertensive heart-failure, and the realisation that spinal or extradural analgesia offered many advantages in the relief of pain during labour for patients handicapped by either cardiac or respiratory disease (Pitkin and McCormack 1928, Cosgrove et al. 1937, Hingson and Edwards 1943).

At different times spinal analgesia has been strongly advocated for obstetric operations in toxæmic and eclamptic patients, but we believe that it was used therapeutically for the first time in 1928 (Paramore 1928). The introduction of methods which allowed conduction blocks to be maintained for long periods (Lemmon 1940, Hingson and Edwards 1942) greatly added to the practical value of this approach in the management of eclampsia. In this way it is possible to produce a controllable fall in blood-pressure for any required length of time, thus reducing the load on an embarrassed heart and avoiding the dangers of fœtal sedation.

The first case to be treated thus in the United Kingdom was described by Bryce-Smith et al. (1949). Since then we have treated six more cases, and in the light of this experience we have some further observations to make.

Case-reports

Case 1.—A primigravida, aged 21, had a normal antenatal history until the 31st week, after which the blood-pressure rose steadily, œdema of the legs and albuminuria appeared, and she was delivered of a stillborn child at the 35th week. After this she was admitted to this hospital as an emergency, with a blood-pressure of 170/100 mm. Hg, generalised œdema, anæmia, anuria, headache, and disturbance of vision. For the next twenty-four hours, during which she was sedated heavily, the blood-pressure continued to rise and the signs of cerebral irritation increased.

A continuous caudal block was started, but had little effect on the blood-pressure, despite apparently satisfactory high levels of analgesia (fig. 1). The patient said she felt more comfortable, but after twenty-four hours she was becoming unmanageable, and it was feared that she would pass into acute heart-failure.

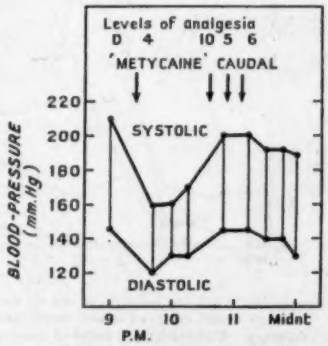

Fig. 1—Case 1: Apart from an initial fall following the establishment of the caudal block the blood-pressure remained high in spite of adequate levels of analgesia.

A continuous spinal block was therefore established, and her general condition much improved; the blood-pressure was controlled (fig. 2), and the cerebral symptoms vanished. During the ensuing thirty-six hours there was a steady increase in urinary output (fig. 3), with a corresponding reduction of œdema. The block was maintained for five and a half days, and only minimal sedation was necessary to maintain the required restful state. The patient made such good progress that the catheter was removed; but four days later, finding restrictions of her activity irksome, she got out of bed while unattended for a moment, collapsed, and died of acute heart-failure.

Case 2.—A primigravida, aged 34, was admitted to hospital as an emergency having had four eclamptic convulsions at home. Her normal weight was 20 st. and she was not aware that she was pregnant, although her uterus was enlarged to the size corresponding to a pregnancy of 36 weeks. At this time her weight was estimated at 26 st. She was breathless, delirious, and uncoöperative. Her blood-pressure was 280/220 mm. Hg, and she had oliguria, albuminuria, and gross œdema. Heavy doses of sedatives administered for eighteen hours did not alter this picture.

A continuous lumbar extradural block was instituted. For four hours there appeared to be some reduction in the systolic blood-pressure with a gradually falling pulse-rate. Subsequently the blood-pressure was not lowered effectively, although an increased volume of solution was injected into the extradural space; and there was some doubt about whether the catheter was correctly situated.

A continuous spinal block was therefore substituted which brought the blood-pressure under immediate control (fig. 4), with satisfactory improvement in the patient's general condition. The spinal block was maintained for three days, during which no sedatives were necessary, and within twenty-four hours the output of urine had returned to normal (fig. 3).

Progress.—The blood-pressure tended to settle at 140/90 mm. Hg, presumably the patient's normal level, and no attempt was made to reduce it further. The patient went into spontaneous labour eighteen hours after the start of the spinal block and was delivered of a stillborn fœtus. It was not known whether the fœtus was alive when the patient was admitted, because it was impossible to detect the fœtal

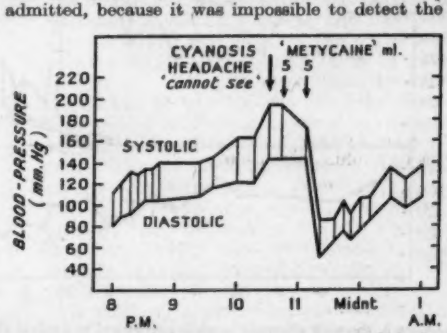

Fig. 2—Case 1: dramatic effect of spinal analgesia on blood-pressure.

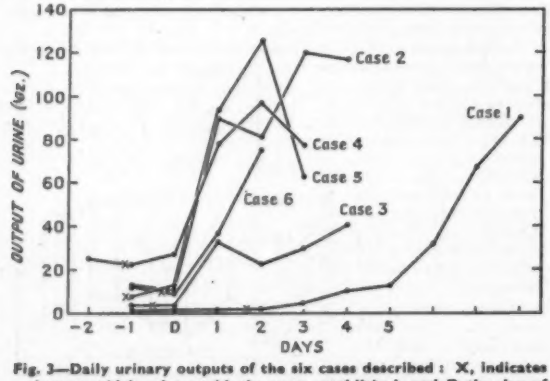

Fig. 3—Daily urinary outputs of the six cases described: X, indicates time at which relevant blocks were established, and D the day of delivery. Cases 1 and 3 suffered severe permanent renal damage, which probably accounts for their failure to conform to the pattern of post-delivery diuresis seen in the other cases.

heart in the presence of such gross obesity. When the catheter was to be removed from the subarachnoid space, a routine sample of cerebrospinal fluid (C.S.F.) sent for examination showed infection with *Pseudomonas pyocyanea*. This complication resulted from the incontinence of the patient and from the difficulties of nursing a paralysed woman of this weight. The infection was overcome with massive intrathecal injections of streptomycin. There were no clinical signs of meningitis, and the patient made a full recovery with no signs of renal or cardiac damage.

Case 3.—A primigravida, aged 21, who had received inadequate antenatal supervision, was admitted to hospital as an emergency at 28 weeks, having had three eclamptic convulsions at home. On admission she was restless and uncooperative, with a blood-pressure of 190/150 mm. Hg, albuminuria, and slight œdema. Sedatives had little effect on the blood-pressure.

A lumbar extradural block was instituted. The patient went into spontaneous labour and the blood-pressure was efficiently controlled for about four hours, while labour progressed without disturbing the patient. Thereafter, although increasing volumes of local analgesic solution were injected and had some effect, it became increasingly difficult to lower the blood-pressure (fig. 7). Restlessness increased, and it was discovered that the 'Polythene' tubing had broken at the skin margin. Rather than re-establish an extradural or spinal block through a potentially infected extradural space we reluctantly reverted

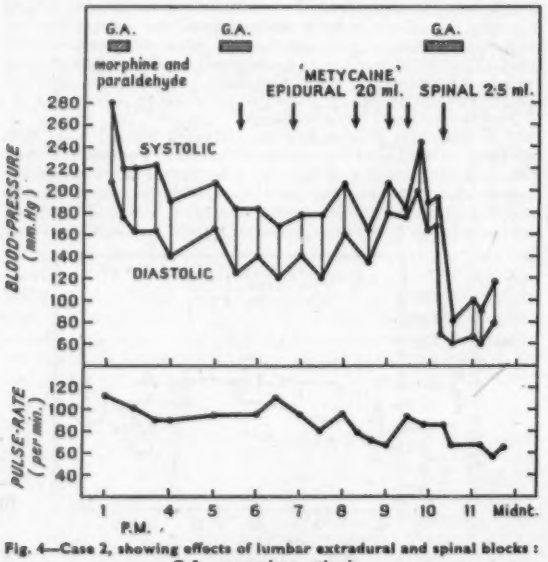

Fig. 4—Case 2, showing effects of lumbar extradural and spinal blocks: G.A., general anæsthesia.

to heavy sedation. Since the initial treatment had been ineffective, we were not surprised that this had little effect on the blood-pressure, and the patient caused anxiety until she was delivered of a stillborn fœtus fourteen hours later. The distal fragment of the polythene catheter was not removed at the time, and an attempt to locate it three weeks later was unsuccessful. When seen a year later, the patient had not suffered on account of this, but she exhibited permanent and grave hypertensive damage to her kidneys and heart. This case did not show a characteristic diuresis after delivery, and this is probably related to her permanent renal damage (fig. 3).

Case 4.—A primigravida, aged 19, was a booked case with a normal antenatal history until the 33rd week, when she had a raised blood-pressure, albuminuria, and œdema of the face. On admission to hospital next day the blood-pressure had risen to 180/130 mm. Hg and there was massive albuminuria. Heavy sedation maintained for sixteen hours had no effect on the blood-pressure.

A continuous lumbar extradural block was instituted, and the patient was delivered spontaneously forty-two hours later of a living baby weighing 4 lb. During the period of continuous extradural block it was found that labour appeared to be retarded when the level of the block was raised to control the blood-pressure adequately. After thirty hours it became necessary to increase the volume of the local analgesic solution injected and to make the injections more frequently. Thus, at the beginning of the treatment 15 ml. of 1% lignocaine was effective, but at the time of delivery 50–60 ml. of solution was required to achieve the same effect (fig. 8). The urinary output returned to normal rapidly (fig. 3), and the patient made a satisfactory recovery.

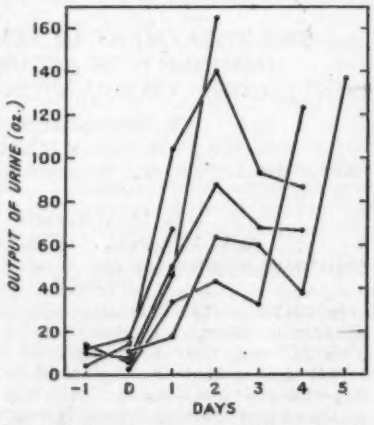

Fig. 5—Daily urinary outputs of six eclamptic patients treated by heavy sedation.

Case 5.—A primigravida, aged 21, had a normal antenatal history until the 28th week, when the blood-pressure started to rise and œdema and albuminuria appeared. At 36 weeks the patient was admitted to hospital as an emergency with a blood-pressure of 200/140 mm. Hg, generalised œdema, drowsiness, and severe oliguria. Sedation with morphine and paraldehyde maintained for six hours had little effect on the blood-pressure.

A continuous lumbar extradural block was instituted. Uterine contractions were noticed at this time but ceased when the level of analgesia rose above T9. To control the blood-pressure a higher level was required, and this presented difficulty without interfering with labour. After about twelve hours it became necessary to increase the volume of solution injected and to make the injections more frequently. Minimal sedation was required, and after twenty-four hours the patient was delivered by forceps of a live baby. Although analgesia was adequate for delivery, an acute hypertensive crisis developed immediately afterwards, and this could not be controlled by the block. It became necessary to reinstitute heavy sedation, and within one or two hours the blood-pressure had settled and the patient made an uninterrupted recovery with a satisfactory diuresis (fig. 3). In retrospect we believe that the conduction block was started before sedation had been given a fair trial.

Thus this case differs from the five others in which sedation was fully exploited, and even then did not lower the blood-pressure. A further point in this patient's history is worthy of interest: when a rapid injection was made through the extradural catheter, the patient complained of severe headache, persisting for about one minute; when the injection was made slowly this did

not happen. The ætiology of this phenomenon is discussed below.

Case 6.—A multigravida, aged 27, was admitted to hospital from the antenatal clinic at the 35th week with a raised blood-pressure and albuminuria. For the next three days the blood-pressure continued to rise until it reached 220/140 mm. Hg despite treatment with diamorphine hydrochloride 'Sodium amytal,' 'Serpasil,' and, later, morphine and paraldehyde.

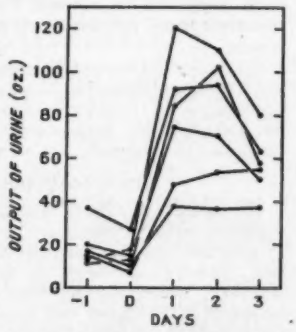

Fig. 6—Daily urinary outputs of six healthy obstetric patients.

A lumbar extradural block was established under general anæsthesia, and the membranes were ruptured. No further sedatives were given, and the blood-pressure was immediately controlled with extradural injections of 1% lignocaine and for several hours remained constant at 130/90 mm. Hg—the patient's normal level. Strong uterine contractions were occurring regularly, but for ten hours there was clinically little evidence of progress. It then became necessary to give the extradural injections at shorter intervals, but despite this the blood-pressure could not be maintained as steadily as before. This led us to believe that labour was now progressing rapidly, and she was delivered spontaneously three hours later of a living female child weighing 5½ lb.

Sedation

To avoid repetition details of sedation have not been included in the case-reports. The routine adopted in all cases is the administration of heavy doses of sedatives to lower the blood-pressure and to control convulsions. Where necessary, a general anæsthetic may be given also to assess the patient obstetrically. Thus, as an extreme example, case 2 received a general anæsthetic, followed by rectal paraldehyde 21 ml. in olive oil, intramuscular paraldehyde 10 ml., morphine 32 mg., and sodium amytal 390 mg., within ninety minutes. Although convulsions ceased, and her respirations decreased to 6 per minute, her blood-pressure was not controlled.

If, however, a satisfactory reduction of blood-pressure is achieved it can generally be maintained by giving intramuscular morphine 16 mg., and rectal paraldehyde 21 ml. (in 170 ml. of olive oil) alternately every four hours.

Methods and Technique of Anæsthesia

In the six cases reported here, caudal, lumbar extradural, and spinal approaches were used. A length of plastic tubing was inserted through either a caudal or a Tuohy needle (Southworth et al. 1953). The site of puncture is sealed with paraffin gauze impregnated with penicillin powder, and the external part of the plastic tubing is fastened to the patient's back with a long length of adhesive strapping 2 inches wide. The free end, to which a syringe remains attached, can be either brought over the patient's shoulder and fixed to the chest or placed under a pillow.

Since conduction blocks of this type may need to be maintained for several days at a time, the risk of infection is obvious, and the utmost care is needed to avoid contamination of the free end of the plastic catheter. To ensure this a syringe attached to the free end of the tubing provides, we believe, the most effective seal, but a fresh sterile syringe must be used for each injection. When a continuous spinal block is in progress, the pressure of C.S.F. may force back the plunger of the syringe, allowing it to become contaminated. This can be avoided by strapping the plunger to the barrel of the syringe. It is advisable to take routine samples of C.S.F. so that if infection is introduced it may be recognised immediately and appropriate treatment instituted.

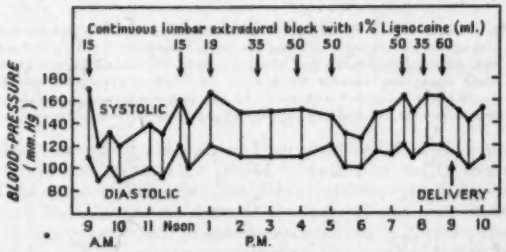

Fig. 8—Case 4, showing control of the blood-pressure; it was necessary to increase progressively the volume of local analgesic solution injected into the extradural space, and to make these injections at shorter intervals.

Since it is often difficult to achieve an adequate level of analgesia with a caudal block, we believe that this approach is the least useful in the management of eclampsia. Usually, a continuous caudal block used for delivery in normal obstetrics has little effect on the blood-pressure (Lull and Hingson 1948), and this was so in case 1.

A lumbar extradural block usually provides adequate levels of analgesia and efficient control of the blood-pressure for limited periods. However, in all the cases in which the method was used it was found that, with the passage of time, increasing volumes of solution were needed to obtain the desired result, and that, as the time for delivery approached, the injections had to be given more frequently. Also, on some occasions, it became impossible to provide a sufficient fall in blood-pressure. There is no doubt that a spinal block provides a far more efficient and certain method of controlling the blood-pressure, but this technique carries with it the risk of meningitis.

Case 1 shows that violent swings of blood-pressure can lead to heart-failure, whose warning signs are a falling pulse-pressure and a rising pulse-rate (fig. 9). If the blood-pressure and pulse-rate are charted graphically, these signs are seen readily. This method of recording also demonstrates the basic blood-pressure level of each case, and no

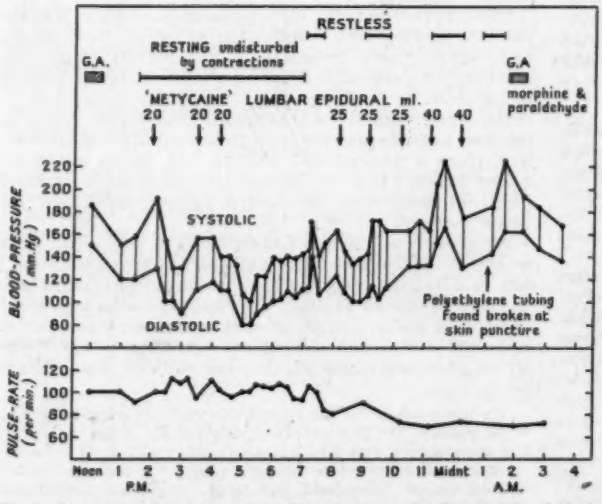

Fig. 7—Case 3, showing failure of what had been an effective extradural block owing to breakage of the polythene catheter: G.A., general anæsthesia.

advantage is gained by lowering the blood-pressure further (cases 2 and 6).

Before any of the blocks under discussion are undertaken, certain safety measures should be to hand—oxygen, a means of inflating the lungs, transfusion apparatus, a tilting bed, and a vasopressor drug such as methylamphetamine hydrochloride ('Methedrine'). A syringe containing thiopentone is advisable, too, in view of the remote possibility of convulsions due to rapid absorption of the drug used for producing local analgesia.

The injection of solution into the extradural space undoubtedly influences the pressure of the C.S.F.,

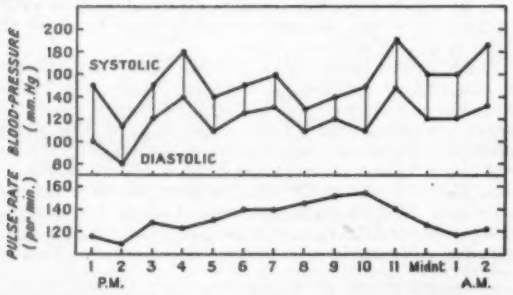

Fig. 9—Case 1: in an effort to promote diuresis the blood-pressure was made to "swing." During the period between 5 p.m. and 9 p.m. the pulse-pressure fell and the pulse-rate (indicated by the lowest line) rose, the patient tended to be slightly cyanosed, and her respiration became "bubbly." As the pulse-pressure increased, so the pulse-rate fell and the patient's general condition improved.

and this fact has been used in treating postspinal headaches (Rice and Dabbs 1950). However, we are not aware of any method which will raise the pressure of the C.S.F. in a healthy person to such an extent that headaches result. Case 5 is exceptional in that a rapid injection of solution into the extradural space caused a violent headache lasting about a minute. A slow injection did not have this effect. This time-relationship coincides closely with the duration of peak C.S.F. pressures when these are raised by injection into the subarachnoid space (as during the induction of spinal analgesia). Experiments made by one of us (R. B-S.) showed that the intraspinal injection of 15 ml. of light cinchocaine could raise a normal C.S.F. pressure to about 650 mm. H_2O, but the pressure fell rapidly to 150 mm. H_2O within thirty seconds and then returned to the normal pre-injection level much more slowly. In these experiments the patients suffered no headaches, but it could be argued that in case 5 the C.S.F. pressure was already raised by œdema of the brain.

Obstetric Problems

There seems to be little doubt that, once the blood-pressure has been controlled by continuous conduction block, heavy sedation is unnecessary. By controlling the blood-pressure it is possible to avoid eclamptic convulsions and the subjective symptoms of headache, disorientation, and blurred vision so commonly present in a hypertensive crisis.

The avoidance of heavy sedation by using continuous conduction block offers the best chance of survival for the fœtus and tends to reduce the incidence of respiratory morbidity in the mother. The comparison between the wide-awake coöperative patient under conduction block and the comatose woman under heavy sedation, who, despite skilled nursing, is liable to develop pulmonary complications, is most striking. The dangers in heavy sedation of balancing the claims of the fœtus against those of the mother, as the time of delivery approaches, can also be avoided. Apart from its therapeutic value the block also serves as the anæsthetic for delivery, whether operative or spontaneous.

In cases 4 and 5 there was evidence that the progress of labour was retarded by the block when it reached the level considered adequate for controlling the blood-pressure. It often requires fine judgment to choose the proper dosage which will provide a level of analgesia sufficient to control the blood-pressure yet at the same time not interfere with the normal course of labour.

We intend in future to maintain the block at the best level for controlling the blood-pressure and to use, when necessary, an oxytocin drip (1–5 units of oxytocin per 500 ml. of 5% glucose solution according to individual response) to stimulate a normal rate of labour.

Effect on Urinary Secretion

Hughes et al. (1948) described dramatic responses in patients with oliguria and even anuria to continuous conduction blocks. This was not seen in any of our cases. All, however, showed a striking diuresis following delivery, which usually took place within twenty-four hours of establishing the block (fig. 3). Daily urinary-output charts of six eclamptic patients treated by heavy sedation with morphine and paraldehyde (fig. 5) and six healthy obstetric patients (fig. 6) show a similar pattern. As might be expected, the daily output of the healthy patients was not usually so high as that of the eclamptic patients, since excessive antenatal retention of fluid is characteristic of the latter group.

We have seen anuria from other causes respond favourably to block therapy, but in this series the postpartum diuresis was related to the time of delivery and was uninfluenced by any therapeutic measures.

Conclusions and Summary

Six cases of eclampsia treated by continuous conduction block are described. Our present impression is that a block by the caudal route is of little value. The blood-pressure is controlled most effectively by continuous spinal analgesia, but this carries the risk of meningitis. A continuous lumbar extradural block is safer, and for twenty-four hours will give almost as good results as a spinal.

Whichever method is chosen, there is a chance that labour will be retarded by a block which reaches the optimal level (varying from patient to patient) for controlling the blood-pressure. In such instances, it is suggested, rather than to lower the level of the block, a pitocin drip should be established to stimulate normal uterine function.

The improvement in the appearance of an eclamptic patient treated with conduction analgesia is striking; and, since heavy sedation is unnecessary, maternal morbidity is reduced and the fœtus offered better chance of survival.

On these grounds a continuous conduction block in selected cases is preferable to treatment with sedatives; but, since a postpartum diuresis can be expected to follow delivery in most cases, eclamptic oliguria by itself does not necessarily provide a specific indication for block therapy.

At present we do not feel justified in suggesting that a conduction block be used in all cases of severe toxæmia; but in desperate cases, such as we have described, block therapy has much to offer. Nevertheless such treatment presents a disadvantage, since it is necessary to provide constant supervision throughout the twenty-four hours by an anæsthetist and an obstetrician, who must always be at hand.

We are grateful to the nurses for their untiring help with these cases; Sir Robert Macintosh for his valuable advice and assistance; and Mr. J. Stallworthy and Mr. W. Hawksworth, under whose care these patients were admitted to the United Oxford Hospitals, for their advice and permission to publish.

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MUSCLE IMBALANCE IN THE CAUSATION OF SCOLIOSIS

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FUTURE progress in the prevention and treatment of deformities will largely depend on increasing our knowledge of their ætiology. Although the conclusions of this paper are tentative and incomplete, we feel that they are worth recording because they throw light on a difficult and important problem—the ætiology of scoliosis.

In some cases of scoliosis there are obvious skeletal abnormalities—e.g., hemivertebræ, fused ribs, and funnel chest. These are cases of congenital scoliosis.

In other cases the scoliosis develops after an attack of poliomyelitis—so-called paralytic scoliosis. Even in these cases, however, the exact mechanism of production of the deformity is uncertain (Steindler 1929, Lowman 1932, Mayer 1936, Colonna and Vom Saal 1941). If it is merely a question of muscle imbalance, which muscles are concerned? Spinal or extraspinal? If spinal, are the stronger muscles on the convex or the concave side? It has been suggested that fascial contracture (Bennett 1952, Clark 1954) may be responsible, or that there is a primary disturbance of vertebral growth, even in paralytic cases.

Next there is a relatively small group of cases in which the scoliosis is associated with a condition such as muscle dystrophy, neurofibromatosis, syringomyelia, or hereditary ataxia.

Finally there is the largest group of cases, in which no definite cause can be found for the scoliosis—the "idiopathic" group.

The object of the present investigation was to assess the rôle of muscle imbalance in scoliosis. Known cases of paralytic scoliosis were examined to find out which muscles were weak and what type of imbalance caused deformity. Next, some cases of idiopathic scoliosis were examined to discover whether occult muscle imbalance (i.e., indetectable clinically) played a part in causing some of these deformities. The theory that many cases of idiopathic scoliosis are due to an undiagnosed attack of poliomyelitis is, of course, an old one, but hitherto it has been hard to find objective evidence in support of this theory. We also examined cases of congenital scoliosis to act as controls.

Methods

It is relatively easy to assess the strength of limb muscles clinically, but it is difficult to assess the strength of individual trunk muscles by ordinary clinical means.

Jansen (1913) suggested that unequal diaphragmatic activity was a cause of scoliosis. Therefore we had radiographs taken of both sides of the diaphragm in full inspiration and full expiration, and measured their excursion. The other trunk muscles were assessed by electromyography.

A two-channel electromyograph was used to compare the activity of muscles on each side of the body. Recordings were usually made with surface electrodes, but in some cases needle electrodes were also used for the deep spinal muscles.

The electromyograms were displayed side by side on a double-beam oscilloscope and their amplitudes compared. The amplitudes are directly related to the mechanical response of the muscles (Inman et al. 1944, Loofbourrow 1948); they were expressed as submultiples of a full-scale deflection arbitrarily defined as 5 units.

The procedure adopted was as follows. When the patient was comfortable on a couch, the skin over the muscles to be investigated was carefully cleaned and massaged with an electrode jelly saturated with salt. The electrodes were next placed at equal distances apart on either side. A standard distance could not be adopted because of the deformities resulting from the scoliosis. The electrodes were securely fastened to the skin with adhesive tape, and records were taken during certain standard procedures: (1) maximal inspiration; (2) maximal expiration; (3) head raising; (4) left lateral flexion of the trunk; and (5) right lateral flexion of the trunk. The respective situations of the electrodes (normally two inches apart) were as follows: (1) on the lateral abdominal muscles in the anterior axillary line; (2) on the rectus abdominis muscle one inch from the median line;

TABLE I—RESULTS OF ELECTROMYOGRAPHY IN TYPICAL IDIOPATHIC THORACIC SCOLIOSIS (CASE 30)

Muscle	Side	Inspiration	Expiration	Head raising	Right lateral flexion	Left lateral flexion	Total
Lateral abdominal	R	4	5	1	5	1	15
	L	5	5	2	1	5	18
Rectus abdominis	R	0	1	1	2	1	5
	L	0	1/2	1	1	1	3 1/2
Intercostal	R	1	4	5	3	5	18
	L	4	4	5	2	0	15
Lumbar ..	R	0	0	5	3	5	13
	L	0	0	5	3	5	13
Lower thoracic	R	1	0	4	2	1	8
	L	2	0	5	1	1	9
Upper thoracic	R	1	0	3	3	1	8
	L	1	1	4	1	2	9
Needle electrodes at T9 level	R	4	0	5	4	4	17
	L	2	0	5	2	4	13

TABLE II—SUMMARIES OF SIX TYPICAL CASES

Muscle	Side	Case 30	Case 11	Case 12	Case 50	Case 16	Case 35
Lateral abdominal	R	15	7	6	11	14	9
	L	18	16*	14*	8	14	12
Rectus abdominis	R	5	5	/	10	11	7
	L	4	11*	/	9	10	8
Intercostal ..	R	18	19*	/	9	7	17
	L	15	8	/	12	6	15
Lumbar ..	R	13	18	15	16	12	15
	L	13	10	9	15	11	14
Lower thoracic	R	8	9	14	16	14	17
	L	9	20*	8	15	13	13
Upper thoracic	R	8	13	17*	12	19*	16
	L	9	12	7	13	8	12
Needle at apex of curve	R	17	2	21*	2	18*	20*
	L	13	22*	2	18*	3	4

* Difference considered significant.
Cases 30 and 35 idiopathic; cases 11, 12, 50, and 16 paralytic.
Cases 30, 11, and 50 convex to left; cases 12, 16, and 35 convex to right.
Cases 50 and 35 primary lumbar curves; cases 30, 11, 12, and 16 thoracic.

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(3) on muscles in the sixth intercostal space in the mid-clavicular line; (4) on the superficial spinal muscles at equal distances (usually $1^1/_2$ inches) on either side of the spinous processes and at three different levels; and (5) the deep spinal muscles were investigated by touching the laminæ with the needle point and withdrawing the needle about a quarter of an inch.

Usually skin electrodes were used, but in addition, whenever possible, recordings were taken from the deep spinal muscles with needle electrodes. This requires considerable coöperation from the patient, and needle electrodes cannot be easily used in small children. Electromyography was also used for investigating muscle activity in a large number of healthy adults and gives an accurate picture of the electrical activity of the muscle-fibres in the vicinity of the electrodes.

The usual procedure has been to take recordings from both sides simultaneously during inspiration, expiration, head raising, and right and left lateral flexion of the trunk. Thus in most patients about sixty recordings were made, and these were repeated, if necessary, until we were satisfied that we had obtained an accurate and consistent record.

On each movement activity was assessed on an arbitrary scale of 0–5. The figures for each side were then added. If the ratio between the sums of the figures for each side was less than 2 : 1, the difference was considered insignificant and activity was recorded as equal. If the difference was greater than 2 : 1 it was considered significant.

In tables III and IV "ipse" means that the muscles on the same side as the convexity of the major curve are significantly stronger; and "contra" means that the muscles on the concave side are significantly stronger; (0) indicates that the ratio was between 2 : 1 and 3 : 1; and (+) that the ratio was over 4 : 1; otherwise the ratio was between 3 : 1 and 4 : 1.

Although the numerical assessments are somewhat arbitrary they were always done by the same observer (H. F. V. R.), who is experienced in electromyography and did not know the clinical assessment of the patient. The details of one typical investigation are set out in table I; the summaries of six typical ones in table II; the summaries of all the recordings in table III; and the salient features in table IV. For the sake of brevity and clarity only the recordings from the spinal muscles at the apex of the major curve are recorded in table III, although recordings were taken from at least three levels in nearly all the patients.

TABLE III—SUMMARIES OF ALL CASES INVESTIGATED

Case no.	Needle electrodes at apex	Surface electrodes at apex	Abdominal	Intercostal
Paralytic thoracic:				
1	..	Ipse (+)	Ipse	Equal
2	..	Ipse	Equal	Equal
3	..	Equal	Contra (+)	Equal
4 *	..	Equal	Contra (0)	Equal
5	..	Ipse (+)	Contra	Ipse (0)
6	..	Ipse (0)	Ipse (+)	Ipse (0)
7 *	..	Equal	Equal	Equal
8	..	Equal	Equal	Equal
9 *	..	Equal	Equal	Contra (0)
10	..	Ipse	Ipse	Ipse
11	Ipse (+)	Ipse (0)	Contra	Ipse (0)
12	Ipse (+)	Ipse	Contra	..
13	..	Ipse (+)	..	Ipse
14	Ipse	Equal	Ipse	Ipse
15	Ipse	Equal	Ipse	Contra
16	Ipse (+)	Ipse (+)	Equal	Equal
17	Ipse	Equal	Equal	Equal
18	Equal	Ipse (+)	Contra	Contra
19	Ipse (+)	Ipse (0)	Ipse	Ipse
20	..	Ipse (+)	Contra (0)	Equal
Idiopathic thoracic:				
21	..	Ipse (+)	Equal	Ipse
22	Ipse (0)	Equal	Equal	Ipse
23	..	Ipse (0)	Equal	Contra (0)
24	..	Ipse (0)	Ipse	Contra
25	Ipse (+)	Equal	Equal	Equal
26	Equal	Equal	Ipse (+)	Ipse (+)
27	Ipse (+)	Ipse (0)	Equal	Ipse (0)
28	..	Ipse	Equal	Ipse
29	Ipse (+)	Ipse	Equal	Ipse
30	Equal	Equal	Equal	Equal
31	Ipse (+)	Equal	Ipse	Ipse
32	Ipse (+)	Equal	Equal	Ipse
33	Equal	Equal	Contra	Equal
34	..	Ipse (0)	Equal	Equal
35	Ipse (+)	Ipse (0)	Equal	Equal
36	..	Ipse	Equal	Equal
37	Ipse (+)	Ipse	Contra (0)	Ipse
38	Ipse	Equal	Equal	Equal
Congenital thoracic:				
39	..	Equal	Equal	Equal
40	..	Ipse	Equal	Equal
41	..	Ipse	Contra	Ipse
42 †	Ipse	Ipse (+)	Equal	Ipse
43	..	Ipse (0)	Equal	Equal
44	..	Ipse	Contra	Ipse
45	Contra	Contra (0)	Equal	Contra (0)
46	..	Equal	Equal	Equal
47	Ipse	Contra	Ipse	Ipse
48	..	Equal	Equal	Equal
49	..	Equal	Equal	Equal
Lumbar paralytic:				
50	Ipse (+)	Equal	Ipse (0)	Ipse (0)
51	..	Equal	Equal	Ipse (0)
52	..	Ipse (+)	Ipse	Equal
53	..	Ipse (+)	Ipse	Equal
54	..	Ipse (0)	Ipse	Ipse
55	..	Contra	Equal	Equal
56	Contra (0)	Ipse (+)	Ipse	Ipse
57	..	Equal	Contra (+)	Ipse
Lumbar idiopathic:				
58	Ipse (+)	Ipse (0)	Contra (0)	Contra (0)
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The results of electromyography of intercostal, abdominal, and spinal muscles are expressed in tables III and IV.

No significant correlation was found between imbalance of intercostal and abdominal muscles and the direction of deformity.

In 15 out of 20 cases of paralytic thoracic scoliosis and in 4 out of 8 cases of paralytic lumbar scoliosis the muscles at the apex of the curve were significantly stronger on the convex side (often many times as strong as those on the other side). Of the remaining 9 cases the muscles were equal in 8, but in 7 of these the needle electrodes could not be used. In 1 case the muscles were definitely weaker on the convex side.

In 16 out of 19 idiopathic curves the muscles on the convex side were significantly stronger at the apex of the curve.

Of 9 cases of congenital scoliosis the convex muscles were stronger in 4, the concave muscles in 2, and the two sides equal in 3.

In 8 cases (3 paralytic and 5 idiopathic) the muscles appeared equal or the concave muscles were stronger when superficial electrodes were used; but with needle electrodes the deep muscles were found to be considerably stronger on the convex side. In other cases, even though the convex muscles were slightly stronger with surface electrodes, the difference was far greater with needle electrodes (table II).

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		Contra	0	0	2	2
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Thoracic congenital	11	Ipse	2	5	1	4
		Contra	1	2	2	1
		Equal	0	4	8	6
Lumbar paralytic	8	Ipse	1	4	5	5
		Contra	1	1 *e*	1	0
		Equal	0	3 *f*	2	3
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		Equal	0	0	0	0

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We suggest that, in most of the cases we have examined, it is imbalance of the deep rotator and transverse muscles that is the main factor in producing deformity, and that the first stage in the genesis of scoliosis, in such cases, is a rotation deformity due to unopposed action of the deep spinal muscles. Our findings with needle electrodes confirm this hypothesis.

Summary and Conclusions

Muscle activity was investigated by electromyography in 59 patients with scoliosis.

In the overwhelming majority of these, especially in paralytic cases, the spinal muscles were significantly stronger on the convex side at the apex of the curve.

Probably in nearly all paralytic and many idiopathic curves unopposed activity of the deep spinal muscles causes vertebral rotation and initiates the deformity.

If muscle imbalance initiates the deformity, it should be possible to stop progression of the deformity by weakening the stronger muscles. A simple way of doing this is to excise alternate laminæ and transverse processes at the apex of the curve on the convex side.

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The problem was how to ensure accuracy without sacrificing simplicity and speed, which are essential in routine clinic work. Our previous experience had suggested that the anteroposterior lordotic view might reveal lesions overlooked or concealed behind ribs or clavicles in a postero-anterior film, and thus this view was used as a routine with the postero-anterior in an effort to reduce such errors, which are inevitable if a single film is reviewed by one reader alone. An added advantage of the routine use of two views is the ready elucidation of shadows due to clothing, which occasionally cause confusion if seen on one film only.

After the system had been in use for a trial period, it seemed feasible to assess its value experimentally and to compare the diagnostic value of the additional film and that of an additional reader. An experiment was therefore designed to investigate these points during the routine work of the clinic.

Method

For each patient standard postero-anterior and antero-posterior lordotic views were taken routinely on 70-mm. film and read on the roll in groups of 50–100 at weekly sittings by two observers. It was decided at the outset to simplify the trial by excluding bony and cardiovascular abnormalities from the investigation; only shadows thought to represent conditions affecting the lungs, pleura,

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(3) on muscles in the sixth intercostal space in the mid-clavicular line; (4) on the superficial spinal muscles at equal distances (usually $1^1/_2$ inches) on either side of the spinous processes and at three different levels; and (5) the deep spinal muscles were investigated by touching the laminæ with the needle point and withdrawing the needle about a quarter of an inch.

Usually skin electrodes were used, but in addition, whenever possible, recordings were taken from the deep spinal muscles with needle electrodes. This requires considerable coöperation from the patient, and needle electrodes cannot be easily used in small children. Electromyography was also used for investigating muscle activity in a large number of healthy adults and gives an accurate picture of the electrical activity of the muscle-fibres in the vicinity of the electrodes.

The usual procedure has been to take recordings from both sides simultaneously during inspiration, expiration, head raising, and right and left lateral flexion of the trunk. Thus in most patients about sixty recordings were made, and these were repeated, if necessary, until we were satisfied that we had obtained an accurate and consistent record.

On each movement activity was assessed on an arbitrary scale of 0–5. The figures for each side were then added. If the ratio between the sums of the figures for each side was less than 2 : 1, the difference was considered insignificant and activity was recorded as equal. If the difference was greater than 2 : 1 it was considered significant.

In tables III and IV "ipse" means that the muscles on the same side as the convexity of the major curve are significantly stronger; and "contra" means that the muscles on the concave side are significantly stronger; (0) indicates that the ratio was between 2 : 1 and 3 : 1; and (+) that the ratio was over 4 : 1; otherwise the ratio was between 3 : 1 and 4 : 1.

Although the numerical assessments are somewhat arbitrary they were always done by the same observer (H. F. V. R.), who is experienced in electromyography and did not know the clinical assessment of the patient. The details of one typical investigation are set out in table I; the summaries of six typical ones in table II; the summaries of all the recordings in table III; and the salient features in table IV. For the sake of brevity and clarity only the recordings from the spinal muscles at the apex of the major curve are recorded in table III, although recordings were taken from at least three levels in nearly all the patients.

TABLE III—SUMMARIES OF ALL CASES INVESTIGATED

Case no.	Needle electrodes at apex	Surface electrodes at apex	Abdominal	Intercostal
Paralytic thoracic:				
1	..	Ipse (+)	Ipse	Equal
2	..	Ipse	Equal	Equal
3	..	Equal	Contra (+)	Equal
4 *	..	Equal	Contra (0)	Equal
5	..	Ipse (+)	Contra	Ipse (0)
6	..	Ipse (0)	Ipse (+)	Ipse (0)
7 *	..	Equal	Equal	Equal
8	..	Equal	Equal	Equal
9 *	..	Equal	Equal	Contra (0)
10	..	Ipse	Ipse	Ipse
11	Ipse (+)	Ipse (0)	Contra	Ipse (0)
12	Ipse (+)	Ipse	Contra	..
13	..	Ipse (+)	..	Ipse
14	Ipse	Equal	Ipse	Ipse
15	Ipse	Equal	Ipse	Contra
16	Ipse (+)	Ipse (+)	Equal	Equal
17	Ipse	Equal	Equal	Equal
18	Equal	Ipse (+)	Contra	Contra
19	Ipse (+)	Ipse (0)	Ipse	Ipse
20	..	Ipse (+)	Contra (0)	Equal
Idiopathic thoracic:				
21	..	Ipse (+)	Equal	Ipse
22	Ipse (0)	Equal	Equal	Ipse
23	..	Ipse (0)	Equal	Contra (0)
24	..	Ipse (0)	Ipse	Contra
25	Ipse (+)	Equal	Equal	Equal
26	Equal	Equal	Ipse (+)	Ipse (+)
27	Ipse (+)	Ipse (0)	Equal	Ipse (0)
28	..	Ipse	Equal	Ipse
29	Ipse (+)	Ipse	Equal	Ipse
30	Equal	Equal	Equal	Equal
31	Ipse (+)	Equal	Ipse	Ipse
32	Ipse (+)	Equal	Equal	Ipse
33	Equal	Equal	Contra	Equal
34	..	Ipse (0)	Equal	Equal
35	Ipse (+)	Ipse (0)	Equal	Equal
36	..	Ipse	Equal	Equal
37	Ipse (+)	Ipse	Contra (0)	Ipse
38	Ipse	Equal	Equal	Equal
Congenital thoracic:				
39	..	Equal	Equal	Equal
40	..	Ipse	Equal	Equal
41	..	Ipse	Contra	Ipse
42 †	Ipse	Ipse (+)	Equal	Ipse
43	..	Ipse (0)	Equal	Equal
44	..	Ipse	Contra	Ipse
45	Contra	Contra (0)	Equal	Contra (0)
46	..	Equal	Equal	Equal
47	Ipse	Contra	Ipse	Ipse
48	..	Equal	Equal	Equal
49	..	Equal	Equal	Equal
Lumbar paralytic:				
50	Ipse (+)	Equal	Ipse (0)	Ipse (0)
51	..	Equal	Equal	Ipse (0)
52	..	Ipse (+)	Ipse	Equal
53	..	Ipse (+)	Ipse	Equal
54	..	Ipse (0)	Ipse	Ipse
55	..	Contra	Equal	Equal
56	Contra (0)	Ipse (+)	Ipse	Ipse
57	..	Equal	Contra (+)	Ipse
Lumbar idiopathic:				
58	Ipse (+)	Ipse (0)	Contra (0)	Contra (0)
Lumbar spasmodic:				
59‡	Contra (+)	Contra (+)	Contra (+)	Contra (+)

* Only slight deformity.

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TABLE I—RESULTS DISTRIBUTED ACCORDING TO READERS AND VOTES FOR ACTION

		Reader A				
	—	"No action" on both readings	"Action" on both readings	"No action" on postero-anterior but "action" on combined reading	"Action" on postero-anterior but "no action" on combined reading	Total
Reader B	"No action" on both readings	I 440	II N=30 A=7	III N=10 A=0	IV 25	512
	"Action" on both readings	V N=87 A=15	VI N=15 A=160	VII N=5 A=2	VIII N=8 A=1	293
	"No action" on postero-anterior but "action" on combined reading	IX N=13 A=1	X N=3 A=6	XI N=0 A=3	XII N=1 A=0	27
	"Action" on postero-anterior but "no action" on combined reading	XIII 136	XIV N=13 A=3	XV 0	XVI 16	168
	Total	692	237	20	51	1000

and diaphragm were included. The definitions of "normal" and "abnormal" would have presented some difficulty; so the problem was simplified by substituting "no action" and "action." Films had to be classified in one of these two groups by each reader on each reading, and it was found that the clinic routine was smoothly maintained by this classification, for it was the one used in practice when operating the X-ray service.

To obtain independent assessments of the films each of the two readers (A and B) viewed them alone at separate sessions, recording his reports on the patients' record cards immediately. This method abolished transcription errors since no secretary or written report intervened between the reading and the recording. Furthermore, by using a punch card the subsequent analysis was facilitated.

For the purpose of this trial two clip holes only were provided on the card for each reader: the first for recording the report on the reading of the postero-anterior view alone before looking at the anteroposterior lordotic view; and the second for the combined report on the two films after seeing the anteroposterior lordotic view (this reading might confirm or refute the initial interpretation of the postero-anterior view alone). By not clipping or clipping each hole a report of "no action" or "action necessary" could be recorded on each reading, giving four possible combinations for each reader:

(1) "No action" recorded for the postero-anterior reading alone and for the combined report.

(2) "Action necessary" recorded for the postero-anterior reading alone and for the combined report.

(3) "No action" recorded for the postero-anterior reading alone but the combined report recorded as "Action necessary."

(4) "Action necessary" recorded for the postero-anterior reading alone but combined report recorded as "No action."

Only if either reader recorded "action necessary" on his combined report (postero-anterior and anteroposterior lordotic), even if the other disagreed, was the patient recalled for appropriate large films. The notations "N" and "A" ("normal" and "abnormal") were then applied to these cases to indicate the final agreed (or if necessary arbitrated) report on the further views. Arbitration was necessary in very few cases, and the opinion of a senior radiologist was accepted.

The interval (1 week) between the original small films and the subsequent large ones was sufficiently short to render negligible any errors due to change or disappearance of lesions in that time.

A preliminary survey of about 200 cases revealed that at least 1000 would be required to reach any firm conclusions, and this number is here presented. Records of a few more than 1000 cases were prepared, but 3 of the first 1000 had to be excluded subsequently because of failure to obtain large films. The next consecutive 3 of the number over 1000 were then drawn on to produce the round figure to work with.

Results

The findings on analysis of the 1000 cases are set out in table I, in which the squares are numbered consecutively with Roman numerals for ready reference. A report of "no action" on all 4 readings was recorded for 440, and these were accepted as "agreed normals" without further investigation (square I).

The other possibilities are displayed in the appropriate squares with the results of subsequent agreement (or arbitration) on large films indicated (N or A). By the addition of all those with the notation "A" a figure of 198 is obtained for the total "agreed abnormals." Percentages are related to this figure.

By appropriate additions and subtractions of the figures presented in table I it is possible to assess the performance of the two readers and the value of adding readings or views to the reading of the standard postero-anterior film. The main significant findings are given in table II and show similar trends, varying in magnitude, for the two readers. For either, the lowest yield of the agreed abnormals is given by a single reading of the postero-anterior films alone (89% and 91%). These figures can be increased to 98% when both readers make a single independent report on the postero-anterior film alone. The addition of a reading of the anteroposterior lordotic view increased the abnormality yield for each reader alone (to 91% and 94%) but not so effectively as did dual readings of the single postero-anterior film. In fact dual reading of a single postero-anterior film missed only 4 of the "agreed abnormals" (3 in square XI, 1 in square IX). Furthermore on investigation these 4 abnormalities proved to be minor shadows of doubtful significance. The relative value of the methods in detecting abnormals can be expressed graphically by using the figures for the number of agreed abnormals missed by each procedure, and this is shown in fig. 1.

In assessing the true value of the various combinations of readings the yield of abnormalities should be related

TABLE II—COMPARISON OF RESULTS OBTAINED BY DIFFERENT READERS AND METHODS

Reader	Films read	No. of agreed abnormals discovered	Agreed abnormals discovered as % of total agreed abnormals	Normal recalls
A	Postero-anterior alone	177	89	111
	Postero-anterior and anteroposterior lordotic	181	91	76
B	Postero-anterior alone	181	91	280
	Postero-anterior and anteroposterior lordotic	188	94	132
Both	Postero-anterior alone	194	98	342
	Postero-anterior and anteroposterior lordotic	198	100	185

to patients called for further films who subsequently proved normal (" normal recalls "). These are presented in the last column of table II. It will be seen that single readings of the postero-anterior film gave high figures for normal recalls (particularly in the case of reader B). The addition of the second view, however, had a striking effect in reducing the number of normal recalls (from 111 to 76 for A, and 280 to 132 for B). The corresponding figures for dual reading show an equally striking saving when the anteroposterior lordotic view is added, and are represented graphically in fig. 2. Had the lordotic view not been used in this trial, an additional 157 patients would have been recalled. This group has been termed " unnecessary recalls."

Discussion

The pioneer work in this field has come from America, where Yerushalmy and others (Yerushalmy 1947, Birkelo et al. 1947, Yerushalmy 1949, Garland 1949b, Yerushalmy et al. 1950, Yerushalmy 1953) have reached the following broad conclusions :

(1) There is considerable subjective error in interpreting films (about 25% in these series).

(2) This can best be reduced by an independent second reader.

(3) Differences due to different types of film (e.g., 35 mm., and 14 × 17 in.) are negligible compared with the reader variation.

(4) The closest agreement between readers was obtained by replacing descriptive reporting by a simple decision on " action " or " no action."

These conclusions are probably generally applicable since Fletcher and Oldham (1949), Groth-Petersen et al. (1952), and Cochrane and Garland (1952) have shown observer errors of similar magnitude. Holm et al. (1954) have re-emphasised the importance of independent dual reading.

The Lancet (1954), while noting that previous work on this subject had often been under special test conditions, suggests " that under normal working conditions the consistency might be far greater ; . . . It would be interesting to compare the results with those of an experiment made in the course of routine work and involving only routine decisions." Our results in routine practice fully confirm the contention of previous workers that independent dual reading reduces subjective error. It will be seen that our under-reading error when viewing single postero-anterior films alone is 9–11%.

In considering this error, which appears lower than that found by previous workers, three factors may be of some importance :

(1) Whereas Yerushalmy's figures relate to minimal tuberculous lesions, our series contains the mixed abnormalities observed in routine practice—some of them gross shadows.

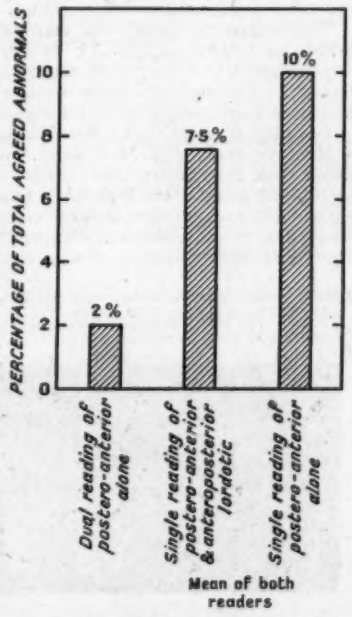

Fig. 1—Agreed abnormals missed by various reading methods.

(2) The agreed abnormals in Yerushalmy's papers are relatively small groups—61 of 1256, and 30 of 1790. We were fortunate to be dealing with a group containing a higher proportion of abnormals—198 of 1000

(3) The lack of an independent panel to define the " agreed abnormals " may have operated in our favour.

The anteroposterior lordotic film has certainly been of value in reducing observer error but more in avoiding " unnecessary recalls " than in increasing the abnormality pick-up rate, especially for reader B. When it is remembered how much personal anxiety and loss of time these unnecessary recalls cause, the anteroposterior lordotic view fully justifies the slight increase in staff, time, and expense. In fact, when 70-mm. film is used, double views, more expensive initially, will ultimately reduce cost if patients recalled are radiographed on large film. We consider that the result shown in fig. 2 is as important as that in fig. 1.

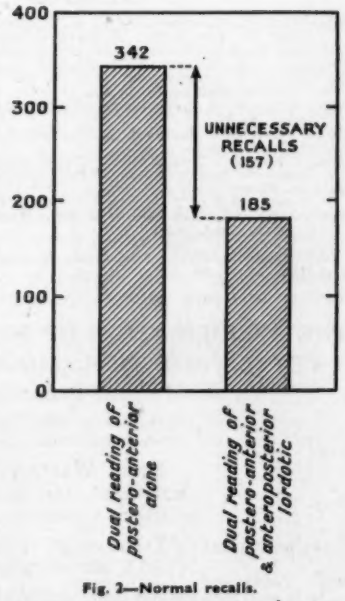

Fig. 2—Normal recalls.

Nearly nine years have elapsed since the presentation of the first paper on this problem, and the chief conclusion —the importance of a second reading—is still neglected in this country. It is probably natural to acknowledge blandly fallibility in others but not in oneself, and this may explain reluctance to insist on dual reading. We agree that an observer-error test is a " chastening experience " (*Lancet* 1954), and any who doubt this should themselves try the experiment.

Objections to dual readings on the grounds of inadequate staff can surely be overcome. Even when a second reader cannot be found, a second independent reading by the same person can considerably reduce observer error (Yerushalmy et al. 1950) : it is hard to justify the continued practice of single reading of single films in routine chest radiography.

Summary and Conclusions

In an effort to find a simple way of reducing observer error in a 70-mm. chest-radiography service single readings of one and two views were compared with dual readings of the same films.

Two observers independently reading a single postero-anterior film achieved greater accuracy than either alone.

The addition of an anteroposterior lordotic view increased the abnormality yield of either reader working alone but was not so effective as the single view read by two observers.

Adding the lordotic view was of greatest value in avoiding unnecessary recalls.

The best results were obtained by dual reading of the two views, thus combining the advantages of both methods.

Dual reading is essential in radiographic surveys, and the routine use of the second view is of very great value in saving unnecessary anxiety, time, and expense.

We sincerely thank Dr. V. H. Springett and Dr. C. M. Fletcher for much help and advice during the trial and for constructive criticism of the manuscript; Dr. R. E. Steiner for reading the films where arbitration was necessary; and Miss A. Keeble and Miss E. Mangan for the radiography.

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THE STERILISATION OF BLANKETS WITH CETYL TRIMETHYLAMINE BROMIDE*

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IT is well established that, in hospitals, blankets are an important reservoir of pathogenic organisms, and that freshly laundered blankets may be as heavily contaminated as those in use (Deicher 1927, van den Ende et al. 1940, Thomas and van den Ende 1941, Rountree and Armytage 1946, Steingold et al. 1954). The usual method of laundering blankets by a low-temperature wash does not sterilise them, and autoclaving is unsatisfactory because it produces gross shrinking and felting. Oiling reduces the dissemination of particles from blankets, but there are objections to this process: it is difficult to control, and the blankets may be unpleasantly oily; moreover, after some methods of oiling, organisms are still present.

The use of quaternary ammonium compounds to sterilise blankets has been suggested by several workers.

Rountree (1946) used an oil-water emulsion stabilised with cetyl pyridinium bromide ('Fixanol C'). Blankets treated with this emulsion were bactericidal for hæmolytic streptococci sprayed on to them from broth cultures. Barnard (1952) also used fixanol C but did not oil the blankets. Virtual sterility of both naturally and artificially contaminated blankets was obtained and some degree of residual bacteriostatic ability was noticeable.

Steingold et al. (1954) used tetra-decylpyridinium bromide and alkyldimethylbenzylammonium chloride on naturally contaminated blankets and found very low bacterial counts after treatment.

Vaughn et al. (1948) rejected quaternary ammonium compounds because of their indefinite action in the presence of anionic synthetic detergents and soap.

Objections to fixanol C are that it has an unpleasant odour, that it stains the blankets, and that it does not dissolve easily. We therefore decided to try cetyl trimethylamine bromide, which is marketed as 'Cirrasol OD' (Imperial Chemical Industries Ltd.). It is an odourless colourless cationic surface-active agent which dissolves easily in water.

* This work forms part of an investigation by the Public Health Laboratory Service for the Newcastle Regional Hospital Board and is partly financed by a grant from the regional board.

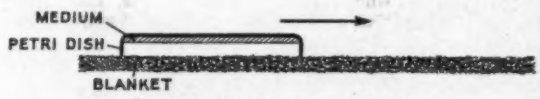


Fig. 1—Method of sampling blankets.

Some of the previous work on the sterilisation of blankets is unrealistic in that artificially contaminated blankets were used and no attempt was made to neutralise residual disinfectant activity in the samples for culture. In any experiment designed to test the bactericidal properties of a chemical substance it is essential that samples taken for culture should be so treated that any of the disinfectant remaining in them (and possibly attached to viable bacteria) is neutralised. If this is not done, the bacteriostatic properties of the substance under test may prevent the growth of surviving organisms and thus give rise to misleading results.

We have worked entirely with blankets contaminated naturally while in use in hospital wards, and have incorporated in our culture medium a neutralising substance for cetyl trimethylamine bromide.

Materials and Methods

Cirrasol OD is an aqueous paste containing about 12·5% of technical-quality cetyl trimethylamine bromide. The consistence of the paste varies with the temperature, but the paste dissolves easily in warm water.

Blankets were taken at random from those coming into a hospital laundry from medical and surgical wards.

Sampling.—The samples were taken by the sweep-plate technique. This method was shown to us by Dr. R. E. O. Williams. The blanket is laid flat on a table or may be sampled in its normal position on the bed. A petri dish containing a suitable culture medium is pressed upside down firmly against the blanket and swept across it fairly rapidly and evenly (fig. 1). The movement of the edge of the plate causes particles of dust and fluff to be thrown on to the surface of the medium. After a little practice it is possible to adjust the pressure and movement so that each plate is evenly spread with about the same number of visible particles.

The *culture medium* was nutrient agar containing 0·75% of 'Perminal COL.'† It effectively neutralised any cirrasol OD which might remain active in the sample (fig. 2). The colonies were counted after the plates had been incubated at 37°C for eighteen hours.

Laundry Methods.—The test blankets were washed in a Manlove and Alliot 34 × 54 in. open-pocket machine fitted with interrupter gear so that the inner container is rotated intermittently. This arrangement is better than continuous rotation because it causes less felting and hardening of the blankets. For a full load the machine was filled with water at a temperature of about 98°F

† Made by Imperial Chemical Industries Ltd., this is a mixture of a non-ionic surface-active agent of the fatty alcohol/ethylene oxide type together with an anionic agent of the highly sulphated oil type.

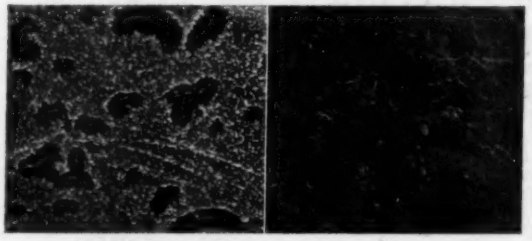
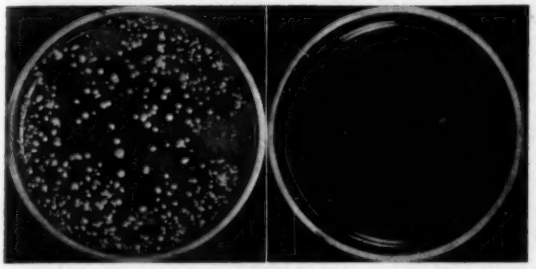


Fig. 2—Fibres from cirrasol-treated blanket causing: *a*, inhibition of *Staph. aureus* on nutrient agar; *b*, no inhibition on perminal-agar.



a *b*

Fig. 3—Sweep-plates from blanket before (*a*) and after (*b*) treatment with cirrasol OD.

(37°C) to give a standing dip of 14 in. Half a pint of 'Lissapol N' ‡ and about 2 oz. of soda ash (anhydrous sodium carbonate) were added, and the machine was run for six minutes. This was followed by one three-minute rinse. The machine was next refilled with water at the same temperature as the wash to give a standing dip of 14 in., and $2^1/_2$ pints of cirrasol OD was added to give a concentration of cetyl trimethylamine bromide of about 0·036%. The blankets were left in this solution for ten minutes with occasional rotation. They were next hydro-extracted and dried in warm air.

The use of a non-ionic detergent for washing is important. Soap and many other detergents are anionic, and traces of them remaining in the blankets may interfere with the action of the cationic cirrasol OD.

Control blankets were treated by the routine method used in the laundry. This involved washing with an anionic detergent followed by two rinses in water.

Results

Treatment with cirrasol produced blankets from which only occasional organisms were isolated (fig. 3). The mean colony-counts on 78 blankets before and after treatment were 194 and 2·6 respectively. In contrast the routine washing procedure was much less effective; the mean counts for 42 blankets before and after washing were 346 and 208 respectively. Tables I and II show the counts on the 12 most heavily contaminated blankets from each series.

TABLE I—SWEEP-PLATE COUNTS ON 12 BLANKETS BEFORE AND AFTER TREATMENT WITH CIRRASOL OD

General bacterial counts on sweep-plates		General bacterial counts on sweep-plates	
Before treatment	After treatment	Before treatment	After treatment
2000	1	329	0
2000	10	313	7
1800	3	328	1
900	11	295	0
411	1	251	0
340	1	240	2

After treatment with cirrasol the blankets were of normal appearance and texture and odourless. We were able to show that cirrasol remained in the blankets by shaking them over culture plates sown with *Staphylococcus aureus*. After incubation the growth of the staphylococci was completely inhibited in well-marked zones round the pieces of blanket fibre (fig. 2a).

Discussion

The whole subject of the washing and sterilisation of hospital blankets deserves more thought than is often given to it. In many hospitals blankets are washed only if the patient dies or has had an infectious disease. We believe that this is not only wrong but also dangerous. Many workers have now shown that patients in hospital quickly become nose and skin carriers of antibiotic-resistant staphylococci. Blankets are largely responsible for the transfer of these organisms from patient to patient, and should be washed and sterilised afresh for each new occupant of the bed. Possibly this routine would be more acceptable to hospital authorities if the great damage done to blankets by heat sterilisation could be avoided.

The efficacy of quaternary ammonium compounds for the sterilisation of blankets has been suggested by the results of other workers, who did not, however, neutralise residual disinfectant remaining in the blankets. Their results have thus failed to show that organisms in the blankets are killed. The experiments reported here show that susceptible organisms are actually killed and not merely inhibited on the culture plates. Sterilisation of blankets with cirrasol is simple and should be used as a routine procedure in hospital laundries. The only precaution necessary is to ensure that preliminary washing is done with a non-ionic detergent. The first treatment of old blankets by the process we have described sometimes gives unsatisfactory results, but subsequent treatments achieve near-sterilisation. We think that this is because the blankets contain a residue of soaps or of anionic detergents, in which they were previously washed, which partly neutralises the bactericidal properties of cirrasol.

TABLE II—SWEEP-PLATE COUNTS ON 12 BLANKETS BEFORE AND AFTER WASHING WITH ANIONIC DETERGENT

General bacterial counts on sweep-plates		General bacterial counts on sweep-plates	
Before washing	After washing	Before washing	After washing
2000	740	800	190
2000	776	622	1028
2000	1332	600	560
1400	716	528	640
1028	260	279	752
972	860	170	404

Cirrasol OD is less active against *Pseudomonas pyocyanea* than against many other organisms. It is, however, highly active against *Staph. aureus*, and this is of great value because of the increasing prevalence of infection of surgical wounds by antibiotic-resistant staphylococci.

We have not yet been able to show to what extent cirrasol-treated blankets retain disinfecting ability and hence influence the number of airborne organisms in the wards during bed-making.

The cost of the treatment above that of normal laundering is about $3\frac{1}{2}$*d.* a blanket. The washing and sterilisation are, however, done as a continuous process, and separate handling of blankets, as in autoclaving, is avoided. The cost of the materials is therefore offset by a saving in labour.

Summary

Blankets are an important reservoir of pathogenic organisms, because the routine low-temperature wash does not sterilise them. By a simple sweep-plate technique large numbers of organisms were isolated from them.

A method is described whereby blankets are treated with cetyl trimethylamine bromide applied in a laundry washing-machine. After this treatment only a few organisms were isolated.

As distinct from similar previous work with quaternary ammonium compounds, sampling was done on neutralising media to avoid misleading results from residual disinfectant in the samples for culture.

We wish to thank Imperial Chemical Industries Ltd. for providing materials and for technical advice; Mr. R. I. Aston for advice and assistance; the laundry staffs at Poole Hospital, Nunthorpe, and at Crossgate Hospital, Durham, for their participation in the trials; and Mr. W. R. I. Hollingsworth for some of the photographs.

References overleaf

‡ A non-ionic detergent manufactured by Imperial Chemical Industries Ltd.

ESTIMATION OF BLOOD-OXYGEN SATURATION

A NEW CUVETTE

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Millikan (1942), Wood (1950), and others have described methods for the photo-electric determination of the oxygen saturation of blood, but their apparatus is not generally available. I describe here a simple optical cuvette for use in the Evan's portable photo-electric colorimeter. A preliminary report has been published (Handforth 1953).

Construction

The optical cuvette is constructed from 0·5 mm. bore 'Polythene' tubing wound in a spiral over a 'Perspex' tube (fig. 1); black silk is wound over the polythene spiral so as to lie between adjacent turns and occlude any light which has not passed through the lumen of the tubing. The projecting ends of the perspex tube are painted black for the same

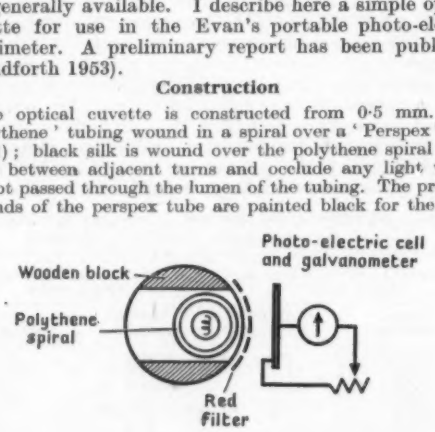

Fig. 1—Diagram of apparatus. The filter transmits only light above 600 Angstrom units and the photo-electric cell does not respond above 8000 A°.

reason. The capacity of the cuvette is 0·2 ml. and it may be used to analyse 0·5 ml. samples.

The source of light is an ophthalmoscope bulb placed inside the perspex tube; for zero adjustment of the galvanometer suitable resistances are placed in series with this bulb and in the photo-electric-cell galvanometer circuit.

The assembled cuvette and light source is mounted in a black perspex or wooden block with a window on one side covered with a red filter (Ilford 205 or Wratten 29); the block fits into the colorimeter.

Calibration

The colorimeter has a logarithmic scale from zero to infinity. The cuvette is filled with isotonic saline and the galvanometer set to infinity with the light off and to zero with the light on.

To calibrate the oximeter, a blood of known hæmoglobin content is serially diluted and the optical densities of fully oxygenated and fully reduced samples are measured (the blood is fully reduced with sodium hydrosulphite). Fig. 2 shows the optical-density curves for fully oxygenated and fully reduced blood plotted against the hæmoglobin values.

* Now at R.A.F. Hospital, Changi, Singapore.

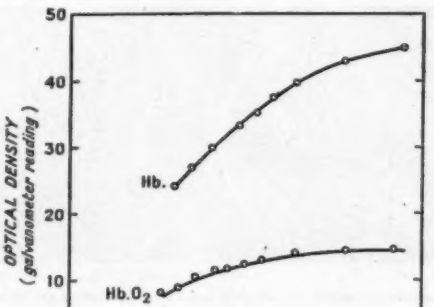

Fig. 2—Optical-density curves for fully oxygenated and fully reduced blood of different hæmoglobin values.

It has been found that the difference in optical density between the fully reduced sample and the fully oxygenated sample of blood is always the same for a given hæmoglobin value, so fig. 3 (uncorrected line) follows simply from fig. 2.

Method

For determining the percentage oxygen saturation of any sample only two readings of the optical density are needed: (1) that of the sample on collection, and (2) that of the sample after full oxygenation. The optical density of a fully-reduced sample is difficult to measure correctly, but it may be predicted from fig. 2:

Thus if a sample of blood is found to have an optical density of 29 and the fully oxygenated sample an optical density of 15, and the total hæmoglobin is 15·6 g. per 100 ml., then the optical density of the fully reduced sample would be $15 + 28 = 43$. The percentage saturation would be

$$\frac{43-29}{43-15} \times 100 = 50\%.$$

In general terms $\frac{\text{reduced reading} - \text{test reading}}{\text{reduced reading} - \text{oxygenated reading}} \times 100$ = percentage saturation.

The estimations are unaffected by the presence of bile-pigments or plasma-lipids, as these do not alter the ratio of the optical-density readings between reduced and oxygenated blood. Errors in the hæmoglobin estimations have relatively little effect on the calculated oxygen saturation because of the shallow slope of the graph in fig. 2. Moreover, it is usually unnecessary to repeat the fully reduced or fully saturated readings in a series of samples of the same blood. When an absolute figure for oxygen content is required, an estimation of the oxygen capacity is made by the manometric method described by Van Slyke and Neil (1924).

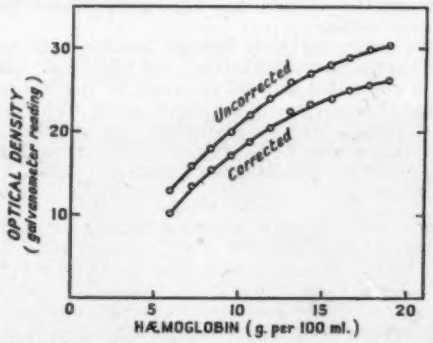

Fig. 3—The difference in optical density between fully oxygenated and fully reduced blood for different hæmoglobin values.

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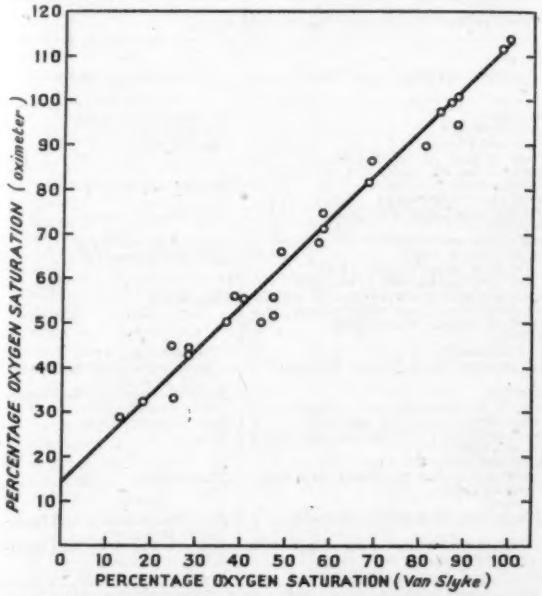

Fig. 4—Linear relationship between percentage oxygen saturation as determined with the oximeter and by the manometric method of Van Slyke.

Accuracy

When a series of estimations are carried out and compared with the results obtained with the manometric method of Van Slyke and Neil (1924) the relationship is found to be linear (fig. 4); but there is a systematic error which in the above example is + 14% at 0% saturation. This error depends on the quantity of sodium hydrosulphite added to the samples in order to obtain the readings recorded in fig. 2. The values plotted in the uncorrected line in fig 3 are therefore corrected by reducing them by 14%.

OXIMETER READINGS OF PERCENTAGE OXYGEN SATURATION (CORRECTED VALUES) ON 25 SAMPLES, WITH THE RESULTS OBTAINED ON THE SAME SAMPLES BY THE MANOMETRIC METHOD OF VAN SLYKE

Oximeter	Van Slyke	Oximeter	Van Slyke
36·5	44·5	88·5	87·0
76·0	81·0	81·0	83·5
84·0	84·5	72·5	69·0
31·5	24·5	18·5	18·0
15·0	13·0	30·0	28·0
61·0	58·0	52·0	49·5
54·0	57·0	42·5	38·0
57·0	58·0	87·0	88·0
38·5	47·0	86·0	86·5
41·5	40·0	37·0	36·0
29·0	28·0	68·0	68·0
100·0	100·0	19·0	25·5
98·0	98·0		

The accompanying table shows the results of 25 analyses; fig. 4 was constructed from the same readings, but with the oximeter values corrected. The standard deviation of the method is ± 4%.

Summary

A simple optical cuvette, consisting of a spiral of polythene tubing, is described for use in any photoelectric colorimeter for the oximetry of whole blood.

The method is reliable and rapid, and requires only 0·5 ml. blood.

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IDIOPATHIC GRANULAR PROCTITIS

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PUBLISHED reports on idiopathic granular proctitis are surprisingly few, and textbooks usually omit it from the differential diagnosis of rectal bleeding: Price's (1947) index does not mention it.

Brooke's (1954) description cannot be excelled:

"... non-specific procto-sigmoiditis, an insidious and indolent condition of the distal end of the large bowel, has been observed by many but recorded by few.... A mild, chronic and intractable inflammation is to be seen in the lowermost part of the rectum, often limited to the last two or three inches with a sharply defined upper limit; less frequently its distribution throughout the rectal ampulla is patchy. On proctoscopy the rectal mucosa in the area involved is granular and bleeds to the touch. Over the course of years the inflammation may spread upwards to involve the sigmoid and at this stage the sigmoidoscopic appearance is not dissimilar from that found in ulcerative colitis ... the onset is insidious and slow and there is no constitutional upset except when secondary anæmia results from constant blood loss."

The condition is, however, distressing to the patient and a social handicap, since the presence of blood in the rectum is apt to precipitate diarrhœa.

Sigmoidoscopic recognition is easy: there is complete loss of the normal satiny sheen of the mucosa (Cropper 1945), whose place is taken by a coarse roughening of the surface due to the exposure of the deeper layers of the membrane.

The inflammation fluctuates unpredictably, and no treatment can be regarded as specific.

Since idiopathic granular proctitis has been so seldom described, I review here my own series of 26 cases (see table). This series excludes all cases of secondary granular proctitis, which fall into two groups: those in which the granularity is a forerunner or concomitant of true ulcerative colitis; and those due to recurrent amœbic dysentery. In both these groups the appearances are identical with those of idiopathic granular proctitis, but in ulcerative colitis actual ulceration of the mucosa can often be seen, with or without blood and pus flowing down from higher levels. Such evidence of actual ulceration rules out, by definition, the diagnosis of idiopathic proctitis. Similarly, granulation occurring as a stage in recurrent amœbic dysentery must almost invariably be regarded as a sequel of acute amœbiasis. Evidence of its amœbic origin will be forthcoming from the history or from serial sigmoidoscopies at which scrapings from ulcers contain entamœbæ. In many cases the metamorphosis, over months, of ulcers into pin-point craters (Cropper 1945) and perhaps of craters into granularity, eliminates benign proctitis from the diagnosis.

Material and Findings

I have kept detailed records of about 2300 patients, chiefly ex-Servicemen, involving about 2800 endoscopies between November, 1946, and July, 1954: 11 of these presented with granular proctitis associated with ulcerative colitis, 7 with granular proctitis following amœbic dysentery, and 26 with the idiopathic granular proctitis. Although 21 of these 26 patients had served in the tropics, and most of them had been labelled "dysentery" at some time in their service, careful study of their history and repeated sigmoidoscopies and stool examinations provided convincing evidence of a non-dysenteric picture.

This work was initiated when I was appointed to the then Ministry of Pensions. Therefore most of the material

ANALYSIS OF CASES OF IDIOPATHIC GRANULAR PROCTITIS

Case no.	Tropical service	Length of observation	Complications at sigmoidoscopy	No. of sigmoidoscopies	Reply to final questionnaire	Original diagnosis
1	Yes	2 mos.	Nil	2	No reply	Bacillary dysentery
2	No	1 yr.	Nil	3	Asymptomatic	Granular proctitis
3	Yes	4 yr.	Polyps	5 (1 almost normal)	Persistent blood	Amœbic dysentery
4	No	4½ yr.	Nil	3 (1 normal)	Blood on and off, gaining weight	..
5	Yes (P.O.W.)	3½ yr.	Nil	4 (1 normal)	Blood on and off, about 5 stools daily	..
6	Yes	3½ yr.	Nil	1	Diarrhœa only	Amœbic dysentery
7	Yes (P.O.W.)	4½ yr.	Polyps	4	Blood every few weeks	..
8	Yes	4 yr.	Nil	3	Periodic blood and diarrhœa	Amœbic dysentery
9	Yes	14 mos.	Nil	2	No reply	..
10	Yes	6 yr.	Nil	3	Bouts of blood in spring	Clinical dysentery
11	Yes	6 yr.	Nil	4	Diarrhœa and blood	Amœbic dysentery
12	Yes	5 yr.	Nil	2 (1 normal)	Blood in attacks, weighs 14 st.	..
13	Yes	5½ yr.	Nil	3 (2 normal)	Blood very occasionally, very fit	..
14	No	4 yr.	Nil	5	Blood now and again, no gain in weight	Dysentery
15	Yes	5 yr.	Nil	5	Constant diarrhœa with blood and mucus, weight fluctuating	..
16	No	1 yr.	1 small polyp	4 (1 normal)	No reply	..
17	Yes	4½ yr.	1 polyp	2	Asymptomatic	Ulcerative colitis
18	Yes	4 yr.	Nil	4 (1 normal)	Still passing blood, general health good	Amœbic dysentery and bacillary dysentery
19	Yes	7 mos.	Nil	3 (1 almost normal)	No reply	Amœbic dysentery and bacillary dysentery
20	No	4 yr.	Nil	1	Loose stools, no blood, very fit	Granular proctitis
21	Yes, 1916 in Mesopotamia	3 yr.	Nil	3 (1 normal)	Blood ceased 12 months ago, generally much better	Dysentery
22	Yes (P.O.W.)	3 yr.	Nil	2	Asymptomatic	..
23	Yes	4½ yr.	Nil	5	4 motions a day, no blood or mucus, weight static	Amœboma
24	Yes	3 yr.	Nil	5	No reply	..
25	Yes	3½ yr.	Nil	5 (2 normal)	Blood rarely, general health good	Amœbic dysentery and bacillary dysentery
26	Yes	3½ yr.	Nil	3	Diarrhœa and blood, always passes a trace of blood	Amœbic dysentery and bacillary dysentery

represents a selected group. Temporary residence in the tropics is not, however, to be regarded as an ætiological factor; nor is the fact that all the patients were male more than fortuitous. Among general hospital patients idiopathic granular proctitis affects both sexes in roughly equal proportions (B. N. Brooke, personal communication).

The patients marked P.O.W. in the table were in Japanese hands and therefore virtually deprived of diagnostic or therapeutic facilities for the first few years of their "dysentery": in these cases the past history of the disease was particularly obscure.

The length of observation shown in the table is the period from when the patient was first seen by me until the date of the follow-up letter. In 4 cases sigmoidoscopy was done at the end of the period of observation, which in all 4 cases was about four years.

The follow-up letters show that in no case was the patient obliged to lose more than an occasional week's work: thus even in cases with a six-year history no gross deterioration has taken place. In case 21 the disease has lasted more than thirty years without causing much inconvenience to the patient.

Discussion

It is important that this syndrome should be clearly defined and kept in mind whenever rectal bleeding is under consideration. If it can be diagnosed with precision, the patient can be assured that his disease is comparatively harmless; this is of great importance because rectal bleeding usually fills the patient with alarm and apprehension, and he is likely to torture himself with possibilities which he hardly dares to mention.

There can be no doubt whatever that a very large number of patients with idiopathic granular proctitis were hastily and uncritically diagnosed as having some form of tropical dysentery and treated as such. Indeed tracing back the history of such cases leads one into a tangle of vague diagnoses which in retrospect is impossible to unravel.

The upshot of this is that, if the syndrome were widely recognised, the evacuation of personnel from forward areas would be minimised, and many an innocent victim would be saved from ill-advised, expensive, unnecessary, and often harmful therapy.

I have often thought that the Forward Malaria Treatment Unit evolved in the late war might well be paralleled by a Forward Dysentery Treatment Unit, where the sigmoidoscope and the microscope could be used within sound of the guns. Such a unit would be of incalculable value in promoting immediate treatment of the true dysenteries, and the immediate return to the front line of patients with granular proctitis.

Note on Treatment

It is my impression that phthalylsulphathiazole suppositories (Cluer 1947) have a place, albeit small, in controlling idiopathic granular proctitis. It is true that, since no infective agent has been incriminated, the use of an antibacterial drug is empyrical. Plain cocoa-butter suppositories are probably just as effective, and it is worth prescribing these, particularly in periods of quiescence. Although severe secondary anæmia was not observed in this series it can develop (B. N. Brooke, personal communication) and would indicate iron therapy. Probably the most valuable part of the treatment is reassurance.

Summary

26 cases of idiopathic granular proctitis are reviewed. The recognition of this syndrome is important, so that it can be clearly distinguished from the more serious conditions of which it may be a forerunner, a concomitant, or a sequel.

I wish to thank Mr. B. N. Brooke for his advice during the preparation of this article. Seeing that war pensioners' medical documents have been used, it is fitting that acknowledgment should be made to the Ministry of Pensions and National Insurance for permission to use these records.

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Reviews of Books

Diagnosis and Treatment of the Acute Phase of Poliomyelitis

And its Complications. Editor: ALBERT G. BOWER, M.D. Baltimore: Williams & Wilkins. London: Baillière, Tindall, & Cox. 1955. Pp. 250. 50*s*.

THIS authoritative and timely statement of American practice comes from the Los Angeles County Hospital—second largest communicable-disease hospital in the United States—and it is based on an experience of over 18,000 cases, 11,000 of them in the last seven years. The main clinical problems are dealt with in turn by the editor and other physicians, by the nurse, otolaryngologist, radiologist, physical-medicine specialist, obstetrician, biochemist, and other experts. The team is united in its advocacy of early elective tracheotomy combined with use of the tank respirator for bulbar poliomyelitis with respiratory involvement. Although no statistical evaluation is attempted (except on a small scale in a final chapter by a county medical team which adopted the same methods), the pros and cons of the team's technique seem to have long passed the stage of academic discussion, and we are clearly dealing with a fait-accompli.

Technical requirements are naturally far from simple: the special equipment required by a unit includes a Bennet respiratory ventilation meter for accurate measurement of tidal air and vital capacity, a positive-pressure attachment exactly synchronised with the cycle of the respirator, a humidifier attachment, an intermittent positive-pressure breathing unit of the demand-flow type, and a juvenile respirator. First-class laboratory facilities for control of blood chemistry are also required. Finally, the well-integrated team of medical and surgical specialists and of experienced nurses must be ready for action at any moment. Under such conditions results got progressively better. Some 60–80% of respirator patients had tracheotomies.

The book is excellently produced and the illustrations are well chosen. Clinicians dealing with acute poliomyelitis will find it stimulating and helpful.

Medical History of the Second World War

The Army Medical Services: Administration. Vol. II. Editor: F. A. E. CREW, F.R.S. H.M. Stationery Office. 1955. Pp. 564. 65*s*.

THE subjects of this volume are preventive medicine in all its military aspects and other activities of the medical services outside or ancillary to the collection and treatment of the sick and wounded. Nursing, dentistry, pathology, radiology, blood-transfusion, psychiatry, and ophthalmology—each has a chapter tracing its growth during the war and the changes in its organisation to meet the needs of the hour. Strictly medical and technical commentaries will appear in later volumes. Administrative detail is likely to make dull reading, but those with long memories will find some persuasive explanations of incidents which seemed addle-pated muddling at the time.

Of greater interest and importance are the chapters on "hygiene"—a word which in the Army embraces an empire which must be the envy of the most ambitious M.O.H. It came as a shock to some civilians in khaki to find that, while they seemed to be more knowledgeable at the bedside (perhaps they had had more practice), the boot was on the other foot when they met the problems of keeping the Army fit to fight. The Army School of Hygiene has yet to receive its due of praise for solid research and ingenious innovation. War brought to it new problems, and this account ranges over the ration-scale, the design of uniforms, medical categorisation (which might have been expanded), environmental hygiene, and the health of those who fought in tanks. It really deserves a volume to itself.

There are other reasons for reading this book than an idle wish to recapture a taste of the purposeful energy of fifteen years ago. It is a monument to many anonymous toilers whose efforts brought victory from near-defeat: it includes many hints and suggestions which deserve further inquiry in these quieter days.

Operative Orthopedic Clinics

LEWIS COZEN, M.D., F.A.C.S., assistant professor of orthopedic surgery, College of Medical Evangelists, Los Angeles; ALVIA BROCKWAY, M.D., chief of staff, Orthopedic Hospital, Los Angeles; in collaboration with PAUL E. MCMASTER, M.D., F.A.C.S., clinical professor of orthopedic surgery, University of California. Philadelphia: J. B. Lippincott. London: Pitman Medical Publishing Company. 1955. Pp. 329. 80*s*.

IN their preface the authors say: "An attempt has been made figuratively to allow the reader to take his place in the operating room of two busy orthopedic services. After the dictated report, the reader will find some remarks similar to the verbal comment the surgeon might make during and after the actual surgery." And later: "Had the operative reports been dictated more carefully, a more lucid picture of the operation would be present in many instances." They do not pretend to cover all orthopædic operations, and their choice appears rather haphazard. On the whole the descriptions of procedures are clear enough, though—with the method they use—there is necessarily much repetition. The main interest, however, lies in the subsequent comments, which cover a wide field not always directly relevant to the operation under discussion. Though it is extremely hard for the reader to get a balanced view of the indications for any particular procedure, he will pick up many valuable tips on overcoming the difficulties that can arise during operation.

The book is largely an account of individual technique, and this of course may differ widely from our own. But it is not easy to believe that displacement of the patella is ever necessary for the removal of an external meniscus or that removal of one-third of the proximal phalanx is sufficient in Keller's operation. The illustrations leave much to be desired, some being pointless, and others positively misleading. Technique can be better learnt, on the whole, from the standard textbooks on orthopædic operations; but the surgeon with some experience behind him will find much to interest him.

Experimental Psychology

Revised edition. ROBERT S. WOODWORTH, Columbia University; HAROLD SCHLOSBERG, Brown University. London: Methuen. 1954. Pp. 948. £3 3*s*.

IN the course of his long life—he was born in 1869—Professor Woodworth has rendered great services to psychology, as investigator and teacher; among the most valued of his contributions has been his handbook of experimental psychology. The historian of this subject, E. G. Boring, said of Woodworth that he "came as near to being the general experimental psychologist as any important man ever did," and the range of his activities and experience justifies this extreme statement. Allied with his exceptional gift for lucid exposition, it enabled him to bring out a book of remarkably catholic completeness within its declared scope. The first edition appeared in 1938, after eight years of determined work in preparing it. In 1949 Professor Woodworth and his collaborator undertook the present thoroughgoing revision. The book contains more material than before, but is not bulkier. Historical surveys have been greatly reduced, and some chapters (e.g., on feeling and experimental æsthetics) have been dropped. The magnitude of the authors' task may be gauged from the size of the bibliography—about 2480 titles, half of which had not been used for the first edition. The chapters on emotion and on learning have been reorganised, in accordance with current development in these fields.

This is not a handbook of psychology. It largely omits, for example, the field of individual differences, social psychology, much of animal psychology, child development, and applied psychology; the name of Freud does not appear in the bibliography, nor Piaget, nor MacDougall. It is concerned only with experimental psychology, which is not the whole of psychology, but the most solid and communicable part, and that which experimental biologists generally, and physiologists in particular, will find closest to their own scientific problems and habits of thought. It is in its own field a masterly standard work.

Virus and Rickettsial Diseases

2nd ed. S. P. BEDSON, M.D., D.SC., F.R.C.P., F.R.S.; A. W. DOWNIE, D.SC., M.D., F.R.S.; F. O. MACCALLUM, B.SC., M.D.; C. H. STUART-HARRIS, M.D., F.R.C.P. London: Edward Arnold. 1955. Pp. 407. 30*s*.

IT is no surprise that a second edition of this commendable work has been called for after five years. Knowledge of viruses has increased so rapidly that there is much to be added or modified. Reviewing the first edition, we suggested that more would soon be needed about poliomyelitis following inoculations and about the Coxsackie viruses: and the expected additions have been made, the Coxsackie viruses now having a chapter to themselves. Naturally there is also a discussion about poliomyelitis vaccines, and it is very apposite. There is a new section on virus multiplication, but the chapter on bacteriophages has been dropped. Altogether the book is as up to date as could be hoped for: there are references to cultivation of varicella and the viruses of acute respiratory disease, though not to Enders's recent work on measles.

Weltraumstrahlung

Der heutige Stand der biologischen Erforschung. J. EUGSTER, Privat-Dozent, University of Zürich. Berne and Stuttgart: Hans Huber. 1955. Pp. 141. Sw. Fr. 26.00.

THIS is an up-to-date review of the present state of knowledge of cosmic radiation, by an author who has made considerable contributions in this field.

The book is divided into two main sections, the first being devoted to the physical properties of cosmic rays, and dealing in turn with heavy primary particles, star-producing nucleon components, neutron components, electron showers, and the relative intensities of the components at various locations above and below the surface of the earth. The emphasis is on the possible biological effects of the physical phenomena discussed.

The second main section deals with methods of investigating the biological effects of cosmic rays. Three methods enabling the investigator to determine which cells have been the targets of cosmic-ray components are reviewed. The first consists of placing a regular pattern of test objects in close proximity to two layers of nuclear emulsion; the second involves the injection of emulsion directly into the tissues under investigation; while the third relies on the photochemical action of incident radiation on certain dyes (e.g., triphenyltetrazolium chloride) or enzymes (e.g., ATPase). In a critical discussion of the results obtained by these methods, Dr. Eugster emphasises particularly the importance of examining the effect of cosmic rays on individual cells rather than on whole tissues or animals.

Two of many questions still requiring answers are whether exposure to heavy primary particles and to nuclear disintegrations can convert precancerous to malignant cells and whether induction or growth of spontaneous or chemically induced tumours may be influenced by maintenance in an environment of low radiation level. There are more than 400 references.

Textbook of Gynæcology (4th ed. London: Heinemann Medical Books. 1955. Pp. 490. 27*s*. 6*d*.).—Gynæcology, Mr. J. H. Peel implies in the preface to his fourth edition, has stood reasonably still for the past five years—anyhow as far as medical students need be concerned. This has left him free to revise his text without major rearrangement, to include new theories about disorders of menstrual function, and to exclude syphilis, which is now so come down in the world as to claim no place in a textbook of gynæcology. Dr. E. W. H. Shawcross has rewritten the section on X-ray treatment; and a new set of drawings of the principal gynæcological operations, by Mr. R. N. Lane, will be welcome to students.

The Diabetic Life (15th ed. London: J. & A. Churchill. 1955. Pp. 228. 12*s*. 6*d*.).—Dr. R. D. Lawrence's book has been a practical guide to the treatment of diabetes for thirty years. This edition includes advice on the use of the new insulins, and other fresh matter.

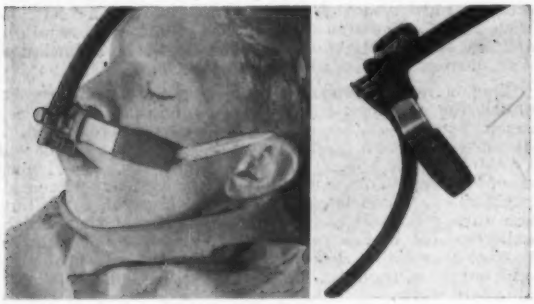
New Inventions

HARNESS FOR ENDOTRACHEAL TUBE

MANY anæsthetists commonly employ either adhesive tape and/or a Hudson harness to secure directly or indirectly an oral endotracheal tube in position.

Both these methods have certain disadvantages. With adhesive tape difficulty is often found in edentulous and hirsute patients; and sweaty, moist, or greasy skins prevent secure adhesion. With the Hudson harness it is often difficult to fasten the hole-and-stud device, especially now that stiff anti-static rubber is being introduced, and there is a tendency to slip on hair or cap material and come off.

My harness is basically a clip attached to a bar, securing the endotracheal-catheter union against movement in any direction. It consists of a piece of aluminium strip, 15 cm. long, 2 cm. broad, and about 1·5 mm. thick, drilled in its centre to take a small brass bolt and nut, which secures a Terry's clip no. 80/0. Both ends of the bar are perforated to take 1 in. cotton tape 15 in. long. The strip is bent to conform with the contours of the maxilla at the level of the upper lip. The bar is padded at either end with rubber guards 4·5 cm. long covering the junction of the bar with the cotton tape. The bolt head in the middle of the bar is padded on the facial side by 2 cm. of 5 mm. thick sponge rubber secured by rubber bands 1 cm. wide at either end. The jaws of the Terry's clip are covered by 1 cm. of anti-static rubber on each.



After the introduction of an oral cuffed or uncuffed tube the clip is placed in position beneath the nose, and the endotracheal-catheter union is pushed into place between the jaws of the clip. The rubber-tubing connection to the anæsthetic-gas supply is then attached without any further securing device. One tape is passed behind the neck to tie with the other at the side of the jaw. In practice this gives absolute security against all untoward sudden movements often experienced in moving the patient into position in the theatre, and in giving controlled respiration. It is in such manœuvres that small movements of the endotracheal tube can give rise to troublesome "bucking" in a lightly anæsthetised patient.

The harness has been designed with the Waters to-and-fro apparatus in mind but can be used with the usual heavy corrugated connecting tubing. This size clip (80/0) will hold Rowbotham's union piece, Magill's nasal, oral, and suction T-pieces; Gillespie's; Cobb's suction union; and Ayres T-piece. Nosworthy's middle-size endotracheal unions are also taken, but the larger and more angular unions of this type are less securely held.

This clip has been used for securing oral endotracheal tubes in more than 100 patients aged 2–75 years, and requires no bending or manipulation once it has been moulded to the contours of the average maxilla. It will also withstand repeated boiling and, provided that the rubber tubing delivering the anæsthetic gases is anti-static, does not require further earthing.

The harness is obtainable from Medical & Industrial Equipment Ltd., London.

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THE LANCET
LONDON: SATURDAY, JUNE 18, 1955

By any Other Name

THE beguiling euphemism "observer variability" has now been applied to the mistakes in interpreting radiographs. It is quite clear that a single observer attempting to pick out cases of pulmonary tuberculosis from a largely normal population is likely to overlook about a quarter of the abnormal films. This proportion has been remarkably constant in repeated trials in several countries, and any variation is more likely to be due to variation in the composition of the population (and especially to the number of difficult borderline cases) than to any difference in skill. Tests of observer error reveal, in addition to the frank "misses," a great lack of consistency. An observer is likely to disagree with his colleagues concerning one in five of the positive cases, though he is a little more consistent with himself; when given the opportunity—for instance, in assessing progress—he swings from "better" to "worse" at second examination of a film in 7% of cases.[1]

The reasons for this surprising state of affairs are not clear; but failure to detect very slight changes is not the only factor, for it is not only the minimal cases that are missed. GROTH-PETERSEN and MØLLER[2] have shown that of the cases missed on a single reading 86% were sputum-positive, 35% were of bilateral disease, and in 15% there were cavities. Nor are the "misses" necessarily lesions difficult to spot: given a second chance, the observer may immediately detect the abnormality and be amazed that he ever overlooked it. It also seems unlikely that the speed of working is an important factor; for, though test material is sometimes examined rather hurriedly, abnormality is usually quickly spotted and prolonged searching does not yield many more cases—though it rapidly increases fatigue. Perhaps boredom and the hypnotic effect of the repeated normal are more important. Opinion can easily become biased in favour of the predominant; after reading many more or less uniform films the observer becomes less inclined to remark on the slightly exceptional. Accuracy might increase if test films were read in small batches of, say, twenty to twenty-five once or twice a day; an experiment on these lines would be valuable. It has been suggested[3] that the conditions of the tests are partly responsible for some of the inaccuracies and inconsistencies they reveal; the observer has a sense of strain, and is forced to reach decisions not made in routine practice. Thus the tests probably present the picture at its very blackest. Nevertheless attempts to test observers without their knowing it have not supported the soothing notion that the observer is much less fallible in ordinary routine work.

One of the more surprising conclusions from these tests is that small films, properly used, can be as reliable for the detection of tuberculosis as the conventional full-sized films—but only if they are interpreted independently by two readers. Fortunately small films are easy to handle and can be readily viewed in special illuminators or projectors in batches of 50–100. A year ago[3] we suggested that the simplest and most effective way of increasing the efficacy of chest-radiography surveys would be by dual reading. This contention is supported by CLAYSON et al.,[4] and by Dr. STRADLING and Dr. JOHNSTON whose article appears on an earlier page of this issue. CLAYSON et al. set out to determine whether 70-mm. photofluorography is a safe and proper method for chest-clinic work. By an ingenious and thorough analysis of their results much more was brought to light. They found, firstly, that for the detection of tuberculosis independent dual reading of 70-mm. film can be as effective as single reading of large films. Secondly, they found that accuracy and consistency improved when simple classifications were used, and were greatest when only "clinically significant" cases were being sought. (An attempt to determine which films showed "active lesions" produced the greatest variability, underlining the absurdity of trying to do this by radiography alone.) Thirdly, they determined the most reliable method of case-finding. Results were best when the small films were used solely to select cases needing further investigation. When the films had been read independently by two readers, all the cases questioned by each reader were recalled. The large films then taken were also read by both readers independently. Even under these rather exacting conditions the cases of active disease that were missed and were subsequently detected amounted to an additional 20% or so.

STRADLING and JOHNSTON report their experience with 70-mm. film at the Hammersmith Chest Clinic. Well aware of the dangers of single observations, they make independent dual reading the rule, and they confirm the increased yield of cases. This double-checking inevitably increases considerably the number of patients recalled for further investigation, most of whom will prove to be free from disease. In an attempt to avoid some of the fruitless increase, they took, in every case, two films—an ordinary postero-anterior projection and an anteroposterior lordotic projection. The results seem very satisfactory; the number of recalls dropped from 111 to 76 for one reader, from 280 to 132 for the other, and from 342 to 185 for both together. This is a most important observation. Small films can compete in accuracy with large films only if dual reading is adopted, but the consequent increase in recall-rate (which is sometimes almost doubled) has been regarded by many as an overwhelming objection to this method—particularly when applied to industrial workers at the factory or pit during working hours, when the temporary withdrawal of a single person may put a whole team out of action. But is dual reading of two films in every case more trouble than it is worth? Would it be more economical, easier, and safer to use

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3. *Lancet*, 1954, i, 87.
4. Clayson, C., Frew, H. W. O., McIntosh, D. G., McWhirter, J. G., McKinlay, P. L., Stein, L. *Brit. J. Tuberc.* 1955, **49**, 81.

large films from the start? The real advantage of miniature photofluorography is that it can deal with very large numbers, but for the examination of smaller numbers its advantages are less obvious. Certainly those particularly exposed to risk of infection—such as tuberculosis contacts, nurses, or medical students—should not be given clean bills of health on the single reading of a miniature film, and there is much to be said for using large films—read twice—to examine such smaller groups, who for one reason or another are already preselected. So far photofluorography has been found reliable only for the detection of tuberculosis, and this method is not necessarily equally valid for detecting shadows of a different quality—for instance, those of pneumoconiosis.[5] In the early stages of a dust disease the lesions are smaller and softer, and are best seen towards the periphery of the lungs, where in miniature films the definition may be impaired by spherical aberration. The suitability of small films for this purpose can be proved only by experiment; but this would be no simple matter, since numbers would have to be large and the investigation most carefully planned to make full allowance for the effect of observer error.

Whatever the purpose of the examination, and whatever the size of the film, it is now apparent that the radiograph should preferably be read by two observers.

Biochemical Disturbance in Hepatic Coma

THE association of mental disturbance with hepatic disease has been recognised since the days of GALEN, but even now the underlying mechanism is far from clear. The term "cholæmia," introduced by LEYDEN [6] in 1866, by analogy with uræmia, implies that the essential fault is in excretion. This hypothesis has had to be abandoned owing to the absence of "cholæmia" in cases of complete biliary obstruction and the failure to incriminate any of the known constituents of the bile. The known functions of the liver now amount to several hundred (and doubtless many more remain to be discovered); so it is hardly surprising that the disturbances responsible for the cerebral disorder have not been easily elucidated. All recent work suggests that the cause is either a breakdown in the detoxicating function of the liver or liberation of a toxic by-product of its disordered metabolism.

In view of the essential rôle of the liver in carbohydrate metabolism, and the death in hypoglycæmia of laboratory animals after hepatectomy, hypoglycæmia might reasonably be expected to be a conspicuous feature of hepatic failure. Yet with few exceptions the blood-sugar levels of patients in hepatic coma are within the normal range. Disturbances of blood electrolytes resulting from the hepatic disorder and the massive intravenous glucose injections with which it is often treated are a largely avoidable, but relatively uncommon, cause of cerebral symptoms. WALSHE'S [7] study of the amino-acids in the blood, urine, and cerebrospinal fluid of patients in coma and precoma revealed more consistent abnormalities, of which a rise in the level of glutamine, and sometimes also of glutamic acid, was the most striking. On the basis of these findings WALSHE "suggested tentatively that changes in the amino-acid pattern of the body fluids are capable of producing varying neurological syndromes," including hepatic coma. A few years earlier it had been found that administration of ammonium chloride to patients with cirrhosis sometimes induced neurological complications [8]; and it seemed that the raised glutamine level found by WALSHE in the cerebrospinal fluid might result from a detoxication mechanism by which the highly toxic ammonium radicle was removed—namely, by combination with glutamic acid to form the amide glutamine. According to this view, cerebral symptoms associated with hepatic disease are the result of ammonia intoxication. The recent findings of Dr. SHERLOCK and her associates [9] confirm the correlation between the blood-ammonium level and the appearance of cerebral symptoms. These workers point out that such a rise can result either from failure of the injured liver to deal with the ammonia arriving via the portal vein or from by-passing of the liver by the collateral circulation provided by portal-systemic anastomoses. They emphasise that since neurological changes can occur without a significantly raised blood-ammonium level, and identical changes can be precipitated by orally administered methionine, the relation of blood-ammonium level to hepatic coma may be similar to that of the blood-urea level to uræmia—i.e., a correlation exists but it is not causal. This hypothesis attributing the cerebral symptoms to ammonia intoxication has led to the use of large doses of glutamic acid in the treatment of hepatic coma.[10] In a small number of patients with hepatic cirrhosis the response to this treatment was quite dramatic. But the results are inconsistent and unpredictable, and in patients with massive necrosis they have been uniformly disappointing. Dr. WALSHE, in a paper published this week on p. 1235, confirms these experiences. He emphasises that the state of the intracellular mechanism dealing with excess ammonia is more important than the ammonium level in the blood. Thus cerebral disturbance could arise from an intracellular defect of this mechanism in the presence of a normal blood-ammonium level, and conversely levels usually regarded as toxic could be tolerated in the presence of enhanced intracellular detoxication. BESSMAN and BESSMAN [11] have shown, by a study of the arteriovenous difference of blood-ammonium, that there is a considerable peripheral utilisation of ammonia, presumably in muscle. Levels of ammonia in systemic venous blood may therefore give no reliable indication of the level in the arterial blood reaching the brain, and this could account for some of the discrepancies recorded by SHERLOCK. BESSMAN and BESSMAN have also shown that in the presence of a raised blood-ammonium level there is considerable intracerebral utilisation of ammonia with a corresponding increase in the cerebral arteriovenous difference. Such utilisation might be due to synthesis of glutamine; but this requires adenosine triphosphate and would result in an enhanced oxygen uptake, whereas the available

5. McCallum, R. I., Browne, R. C. *Brit. J. industr. Med.* 1952, **9**, 99.
6. Leyden, E. Beitrag zur Pathologie des Icterus. Berlin, 1866.
7. Walshe, J. M. *Quart. J. Med.* 1951, **20**, 421.
8. Phillips, G. B., Schwartz, R., Gabuzda, G. J. jun., Davidson, C. S. *New Engl. J. Med.* 1952, **247**, 239.
9. Phear, E., Sherlock, S., Summerskill, W. H. J. *Lancet*, April 23, 1955, p. 836.
10. Walshe, J. M. *Ibid*, 1953, **i**, 1075.
11. Bessman, S. P., Bessman, A. N. *J. clin. Invest.* 1955, **34**, 622.

evidence shows that in coma and precoma uptake of oxygen by the brain is depressed. BESSMAN and BESSMAN therefore suggest that the main reaction consuming ammonia is the conversion by reductive amination of α-ketoglutaric acid to glutamic acid. This could result in the removal of α-ketoglutarate, an essential member of the Krebs cycle, and consequent reduction of the oxidative metabolism of all those metabolites with which this cycle normally deals—a disturbance that would explain the rise in blood pyruvate and glutamate.

The metabolic activities of the liver are so complex that the mental disturbances in patients with hepatic disease would hardly be expected to depend always on the same biochemical disorder. The presence of "fœtor hepaticus" in patients gravely ill with disease of the liver directs attention to toxic metabolites other than ammonia. Professor CHALLENGER and Dr. WALSHE report (also in this issue) the isolation from the urine of such a patient of methyl mercaptan and dimethyl disulphide. These products are derived from methionine by chemical reactions known to occur in vivo. The greatly increased blood-level of methionine in hepatic disease—probably the result of impaired capacity of the injured liver to handle this amino-acid—presumably favours the abnormal metabolic pathway that leads to these odoriferous sulphur compounds. That they are toxic seems likely. Other possible products of disordered methionine metabolism arising from partial oxidation, such as the sulphoxide and the sulphone, may contribute to the clinical picture.

Recent work on the mechanism of hepatic coma thus incriminates ammonia and various sulphur-containing by-products of disordered methionine metabolism. That these comprise by no means all the complex biochemical machinery that relates hepatic to cerebral dysfunction is almost certain. Since there is probably no single cause of hepatic coma would it not, as WALSHE suggests, be advisable to refer to "the hepatic comas"?

An Incomplete Reform

UNWITTINGLY King GEORGE III did much to take the stigma of moral guilt from insanity. The effects on public opinion and on lunacy reform of his first attack of mental illness were (Dr. KATHLEEN JONES says [1]) intangible but real. On his recovery, in 1789, his people were warmly sympathetic: there was for him none of the condemnation then usually accorded to the insane.

> "Nobody suggested that the King was being punished by heaven for his sins; nobody regarded him as being possessed by the Devil; insanity had become a respectable malady—one which might happen to anybody; and, which is even more important, one which was susceptible to treatment and capable of cure."

Not that the treatment accorded to the King was in any way more enlightened than that suffered by other mental patients at the time: he was purged, beaten, starved, and kept in bonds like the rest. But his illness marked a turning-point; for, though there had already been some stirrings of concern about the fate of the insane, little had been achieved before that time.

1. Lunacy, Law, and Conscience. By Mrs. KATHLEEN JONES, PH.D. The International Library of Sociology and Social Reconstruction. London: Routledge & Kegan Paul. 1955. Pp. 234. 21s.

In the early part of the 18th century the medieval conception of charity as a duty every man owed to his neighbour was dying out, and there was no corporate sense of responsibility to take its place. The insane were not regarded as any kind of separate group: if mental illness brought them to penury they came under the poor-law; if it caused them to commit a crime they were judged under the penal code; if they wandered without means of support they came under the vagrancy laws. Bethlem was the only institution of public standing which dealt with the mentally abnormal; and Bethlem—"Bedlam"—was passing through its terrible years. The rich might be kept at home or sent to small evilly run madhouses which offered a pledge of absolute secrecy; the poor were kept in such holes and dark corners as their family chose, or sent to a workhouse or prison. Many still fell under suspicion of witchcraft; and, though the penal laws against witchcraft were repealed in 1736, there were still plenty of people in far villages to try by ordeal insane people suspected of dealings with the devil. Standards of professional training in medicine were miserably low, and treatment was directed to weakening the insane patient by the systematic use of purges and emetics, by bloodletting, blistering, and cautery. The clergy held that human misery was the result of personal sin, while philosophers believed in "natural law" and took the world as they found it, lunatics and all. Pauperism from other causes than insanity was increasing; and the name "workhouse" carried with it, as an official publication of 1732 noted, "an idea of Correction and Punishment." In 1789, when GEORGE III journeyed to Weymouth for his convalescence, there were in workhouses—where punishments for not working or for "mischievous conduct" included solitary confinement in a dark room and deprivation of food—some 4000–5000 psychotic or mentally defective people. Many others were in prisons or bridewells.

Yet as early as 1742 a select committee, set up to revise the vagrancy laws, had paused to consider dangerous lunatics; and the Act which resulted from their recommendations did at least order that the warrant of two or more justices of the peace should be required for their detention, instead of only one justice as for any other vagrant. By 1763 some facts about conditions in private madhouses had become public, and had led to a movement to get statutory supervision of such places. A select committee was appointed, but a Bill to control the abuses was not introduced till ten years later, and then it was rejected by the Lords. An Act for Regulating Private Madhouses was, indeed, passed in 1774, but was so weak and ineffectual that it produced little change in the contemporary scene. Nevertheless, Dr. JONES points out, it did establish five important principles: that private institutions run for profit should be licensed by a public authority; that the reception into them of people alleged to be insane should be notified; that commissioners, whose method of appointment should be prescribed by Parliament, should visit them; that inspection should ensure that those wrongfully detained were released and those rightly detained should be humanely treated; and that they should be supervised by doctors. It was many years before effective legislation converted these principles into practice. Dr. JONES notes—and it is a thing true of

every age—that the reformers themselves were not entirely aware, in these early days, of what they wished to achieve. Perhaps, too, they were rather easily satisfied.

Much was being done outside Parliament. Hospitals were being set up—St. Luke's, London, in 1751; the Lunatic Hospital at Manchester in 1763; and the Retreat at York in 1792. In the first and last of these, gentle measures of treatment and occupation were advocated, and the Manchester Lunatic Hospital dealt more humanely with patients than was common at the time. But the founding of asylums on a national scale began only with the County Asylums Act of 1808, which in turn followed the report of a select committee appointed in 1807. Amending Acts in 1811, 1815, and 1819 dealt with questions of admission, certification, and discharge of patients. These took the responsibility for the admission of patients from the overseers of workhouses and placed it in the hands of magistrates, "thus weakening the connection of the county asylums with the Poor Law authorities."

Meanwhile SAMUEL TUKE had published, in 1813, his *Description of the Retreat*, setting out the "moral" management of the insane as practised there—management, that is, by gentle treatment and social activities. TUKE, moreover, as a member of the Society of Friends, believed in the integrating influence of religion. His patients were given no reason for feeling that their mental disorder cut them off from ordinary interests and activities. The book was widely read, and when another select committee was set up, in 1815, public opinion was strongly with the reformers. The committee found both law and practice in chaos. At one end of the scale was the humanity of the Retreat, at the other the unspeakable barbarities of the private madhouses. They published evidence of appalling conditions, dreadful neglect, and much cruelty. Yet Bills to reform the private madhouses, introduced in 1816, 1817, and 1819, were all, after passing the Commons, rejected by the Lords, the main and most telling opponent being Lord ELDON, the Lord Chancellor. After the third defeat the little band of reformers began to disintegrate: the mentally ill had to wait on, year after year, for another champion.

They found him in 1827, when a new select committee was appointed with Lord ASHLEY (afterwards Earl of SHAFTESBURY) among its members. The committee introduced two Bills, both of which went through without difficulty: the new County Asylums Act required visiting justices to send annual returns of admissions, discharges, and deaths to the Home Secretary; and the Madhouse Act placed the power of inspecting the Metropolitan houses in the hands of a statutory authority. The 15 commissioners appointed under it were to visit without warning, and they had power to recommend that licences should be revoked. The Act also required that a certificate for confinement of any patient should carry the signature of two doctors, as it does today. An exception was made in the case of pauper patients, for whom the signature of one doctor, the parish overseer, and the incumbent, or of two justices, sufficed. The new commissioners, who included Lord ASHLEY, worked so well that two years wrought a most striking change for the better in the Metropolitan madhouses. As the years passed, the commissioners extended their interests: they began to inquire into the characters and conduct of attendants and nurses, listened to patients' grievances and investigated them, and tried liberating recovered patients on trial. In 1842 an Act was passed empowering the commissioners to pay a visit to every asylum and madhouse in the country. The report on the first tour of inspection—"Ashley's report," Dr. JONES says it may fairly be called—was published in 1844 and was the basis of the Lunatics Act, 1845. This gave the lunacy commissioners power to visit not merely the Metropolitan asylums and madhouses, but all county asylums and hospitals for the insane, and any other institution in which the insane might be found. Bethlem—a much reformed Bethlem by this time—was deliberately excluded from such supervision. The Act also provided new methods of certification which decreased the risks of wrongful detention, and required better record-keeping: ASHLEY believed in the value of documents as a safeguard against irregular practice. The apathy and opposition which had defeated earlier Bills had disappeared: the House of Commons was strongly in favour, and such opposition as there was came almost entirely from people who thought the Act did not go far enough.

This is as far as Dr. JONES's review of English legislation for the mentally ill takes us; but in an epilogue she reminds us of the landmarks of the last hundred years—the Lunacy (Consolidation) Act of 1890 (most of its provisions still apply to certified patients), the mental-deficiency legislation of 1913–27, the Mental Treatment Act, 1930, and the National Health Service Act, 1946. Nor is the task of reformers in any sense finished. A Royal Commission, headed by Lord PERCY of NEWCASTLE, set up last year, is considering the extent to which it is now, or should be made, statutorily possible for mentally ill or mentally defective people to be treated as voluntary patients without certification. Northern Ireland [2] has already shown us that, by appropriate legislation, certification, with all its attendant deprivations and legal disabilities, can be very largely avoided.

The story of the change from gross superstition and carelessness to a sense of responsibility for the mentally sick can be paralleled by several other developments in our social history over the past two hundred years. Those who have read Sir DAVID HENDERSON's Morison lecture,[3] however, will be struck again by the resemblance he sees between our attitude to the mentally ill and our attitude to "the behaviour and thought disorders which are indicative of abnormality and crime." Both the mentally sick and the socially undesirable are capable of rousing ugly responses in the rest of us: we find it hard to keep in mind that an antisocial or otherwise troublesome person still counts as one, and not some negligible fraction. Over the past two hundred years our response to the mentally sick has become progressively healthier and more mature; our reaction to criminals, too, has been maturing, though at a slower rate—being more primitive, as yet, by as much perhaps as a hundred years. Of our progress in the mental field Dr. JONES says: "as we reach the point where history shades into present policy and future aspirations, we may derive confidence, if not complacency, from the achievements of the past two hundred years." Perhaps the same may be cautiously said of penal reform.

2. *Lancet*, 1954, i, 1333.
3. Society and Criminal Conduct. Edinburgh: The Royal College of Physicians. 1955. See *Lancet*, June 4, 1955, p. 1159.

Annotations

REST AND ACTIVITY IN ACUTE NEPHRITIS

Åkerrén and Lindgren [1] have been investigating the important question of how long strict bed rest is necessary for patients with acute hæmorrhagic nephritis. They define the régime in the Children's Hospital at Gothenburg as " rest in bed not only until possible ' general nephritic symptoms ' such as increased blood-pressure, œdema, or raised N.P.N. have disappeared, but also until the urinary findings have returned to normal or practically normal." In questioning the need for this expensive routine, they were encouraged by finding that Czerny, of Prague, had recorded in his memoirs in 1939 that children with acute nephritis who played in the streets recovered just as rapidly and completely as those who were made to rest. From 1946 onwards Åkerrén and Lindgren have treated alternate patients with (*a*) strict bed rest and (*b*) mobilisation as soon as macroscopic hæmaturia had disappeared. Patients with recurrent attacks of hæmaturia associated with acute infection were later excluded, leaving 57 patients, of whom 29 had been allowed to get up as soon as overt hæmaturia had disappeared. They found no noteworthy difference between the two groups. Albuminuria and microscopic hæmaturia and increased sedimentation-rate were not more persistent in the " up-and-about " group. Tests of renal function gave similar results in the two groups, and the length of time spent in hospital was rather shorter in the ambulant group. Åkerrén and Lindgren cite similar observations by Frisk and Klackenberg [2] and by Rudebeck.[3]

Early ambulation in acute nephritis, especially if it leads to earlier discharge from hospital, is clearly of advantage to the community ; but it is not quite certain that thereby the patient is running no increased risk of chronic illness. The present series was limited to children, who do rather better than adults. Moreover, there is some evidence that the attacks studied were very mild ; for of the 57 patients only 2 had " tangible œdema " and only 3 had hypertension. Again, there is no information about the delayed incidence of chronic nephritis. Acute type-I nephritis, though the ultimate prognosis is relatively good,[4] may be complicated by cardiac failure,[5] by encephalopathy, and by pulmonary œdema, all of which require bed rest and some of which may outlast macroscopic hæmaturia. On the other hand, no-one would want to keep patients with acute nephritis in bed until the last traces of albumin had disappeared, which might be at the Greek kalends. A fall in blood-pressure and a rise in urine volume—which may be abrupt [6]—are probably better signals for allowing the patient up than the disappearance of gross hæmaturia.

RADIOGRAPHY OF THE COLON

Radiography can contribute much to the diagnosis of lesions of the colon, especially those beyond the range of the sigmoidoscope. But the radiologist often finds that the loops of the colon overlap and obscure each other so that inspection of a suspected area is very difficult ; and he may also be impeded by spasm or actual obstruction of the colon during the barium-enema examination. The colon must be completely outlined in the filled state and all its tortuosities displayed ; then after the patient has evacuated his bowel it is highly desirable that enough of the barium shall remain to outline the mucosal pattern.

1. Åkerrén, Y., Lindgren, M. *Acta med. scand.* 1955, **151**, 419.
2. Frisk, A., Klackenberg, G. *Acta pædiat., Stockh.* 1945–46, **33**, 349.
3. Rudebeck, J. *Svenska Läkartidn.* 1949, **46**, 1.
4. Ellis, A. *Lancet*, 1942, i, 1.
5. Peters, J. P. *Amer. J. Med.* 1953, **14**, 448.
6. Roscoe, M. H. *Quart. J. Med.* 1950, **19**, 161.

It is not always easy to display the mucosal pattern of the colon. Fischer [1] advocated for this purpose insufflation with air, and Maingot et al.[2] the use of thorium-oxide suspensions in place of barium sulphate. Rigler [3] suggested in the early 'thirties that tannic acid should be added to the barium suspension, but this method was widely adopted only in the late 'forties after Hamilton [4] and others had established a claim for it. McLaren et al.[5] have carried the search for an effective technique a stage further by using ' Veripaque ' (dihydroscyphenylisatin) with a barium-sulphate suspension in which the particles are below 0·5 μ in size. Veripaque is a colon stimulant, promoting rapid and complete evacuation ; and the colon can be observed radiographically as evacuation takes place through the enema tube after the colon has been completely filled. McLaren et al. say that with this substance the rate of colonic movements is suitable for accurate observation ; the contractions appear normal in character but increased in speed and vigour. Apparently the increased rate of segmental and mass contractions is not associated with as much colic as may occur when tannic acid is used, and McLaren et al. claim that there are no contra-indications to the use of veripaque. From their experience they conclude that it aids study of structural detail and functional activity, and cases, for example, diagnosis of neoplasm and assessment of stenosis in regional ileitis involving the colon.

DANGEROUS COTS

Three children have died, and one has narrowly escaped death, as a result of accidents in their cots. All the cots had bars close enough together to prevent the children from getting their heads between them, and all the accidents were of the same type : the children slipped between the bars feet first, and, since their heads would not pass through, the weight of their bodies pulled their faces into the bedding and—except for the one rescued in time—they were smothered. In recent years the British Standards Institution (B.S.I.) have issued three standards for hospital and domestic cots, and two of these—issued in 1950 and 1951—recommended that cot-bars in hospital metal cots should be 3–3$^1/_2$ in. apart and those in domestic wooden cots " not more than 3$^3/_4$ in." apart. (Metal bars are less rigid than flat wooden bars, and hence may become slightly bent.) The Ministry of Health and the Home Office were represented on the committees passing these standards—to which they have hitherto given their support. In view of these accidents, however, they have felt obliged to consider the possibility that a standard devised to eliminate one type of accident may contribute to another type.

In a Ministry of Health bulletin, Dr. Rachel Elliott and Mr. W. H. Hammond [6] report that before the British Standards Institution was approached about altering these standards, two large health authorities (the London County Council and Birmingham County Borough Council) and a London pædiatrician were asked to collect measurements of babies and young children aged 6 months to 3 years. Anteroposterior chest and pelvic measurements, and head measurements, made on some 600 children in L.C.C. nurseries, 600 in Birmingham nurseries, and nearly 400 in London hospitals, made it clear that a large proportion of children aged 18 months, greater numbers of younger children, and even some 3-year-olds would be able to get their hips through a 3$^1/_2$ in. space.

1. Fischer, A. W. *Arch. klin. Chir.* 1925, **134**, 209.
2. Maingot, G., Sarasin, R., Duclos, H. Exploration radiologique des colons et de l'appendice au moyen des solutions floculantes. Paris, 1935.
3. Rigler, L. Cited by Weber, H. M. *Amer. J. Roentgenol.* 1950, **63**, 663.
4. Hamilton, J. B. *Ibid*, 1946, **56**, 101.
5. McLaren, J. W., King, J. B., Copland, W. A. *Brit. J. Radiol.* 1955, **28**, 285.
6. *Mon. Bull. Minist. Hlth Lab. Serv.* 1955, **14**, 72.

The chest depth would prevent all but 1% of year-old babies and 5% of 6-month babies from being able to squeeze through far enough to hang by the head; but the Ministry of Health rightly felt that in view of these findings the B.S.I. should be asked to reconsider the standards. The committee dealing with hospital cots did so, and—with full agreement between the medical representatives and the manufacturers—issued a new standard recommending bar spacing of $2^{3}/_{4}$–3 in., with an upward tolerance of $^{1}/_{16}$ in. But unfortunately, the manufacturers of domestic wooden cots have not so far been persuaded to alter the bar-spacing recommended in the existing standard. The possibility of devising some kind of lattice work or mesh, which would get rid altogether of the need for bars and their hazards, does not seem to have been considered.

The Folding Furniture Manufacturers' Association, whose members make 99% of babies' cots, claim that they have always put safety in the foreground of their policy, and that they have a record of fifty years of manufacture, at a rate exceeding 100,000 cots per annum, without a single fatal accident. This is a good record, which they must surely be the last to wish to see broken. It is therefore strange to find them arguing that the risk is only theoretical, depending upon the children being sufficiently emaciated to wriggle through the bars, and "able to contort themselves into the necessary sideways position, and upon the flesh over the buttocks, which was excluded from the measurements, not preventing passage." The 3 in. specification, they say (taking a flight of their own into the realms of theory), "will lead to innumerable accidents such as fractures of arms, legs, &c." They add that the risk described by the Ministry of Health is "so remote as to be more than outweighed in terms of safety measurements"; and that they would welcome an independent public inquiry.

It is difficult to see how any further inquiry would help. This is not a question of theory at all—of what kind of baby by what contortions could bring himself to an untimely end in this way. It is a question of fact: three children have already died from accidents in cots with bars so spaced that their bodies but not their heads could pass between them. Surely the Folding Furniture Manufacturers' Association do not wish to wait until a child dies in this way in one of their own cots? Surely they would rather stand by their own policy and prevent even the possibility of another such disaster?

PERONEAL SPASTIC FLAT-FOOT

THE syndrome of spastic flat-foot, with an eversion deformity, pain in the foot, and tightness of the tendons on the outer side, has still not been fully explained. Bony abnormalities in this region contribute to the disorder [1 2]; and in 17 affected feet Harris and Beath [3] found 15 abnormal bars, either between the calcaneum and navicular or between the talus and navicular. With the special radiographic projections which are necessary to demonstrate the bar it became possible to separate those cases with primary bone defects, which were probably congenital, from those with arthritis in the subtaloid joint.

Spastic flat-foot is almost exclusively confined to adolescents (the Canadian Army foot survey gives an incidence of 2%) and is much commoner in the male than in the female. The height of the long arch is often unchanged; and the peroneal muscles, although prominent, may not be in spasm but merely show adaptive shortening. Possibly spasm, when present, is due to an irritative focus in the subtaloid joint, while true shortening occurs in the presence of a bony deformity. There is some evidence [4] that the everted position is the position of rest for the subtaloid joint. This suggests that treatment directed towards the muscles, or towards correction of the everted position, is misconceived. Tenotomy of the peronei, or division of their nerve-supply, provides only temporary relief, since other muscles continue to produce the deformity. Blockley [5] has shown that manipulation and immobilisation in plaster in the corrected position for three months also gives relief; but at the end of two years few patients were noticeably improved.

In the treatment of patients with symptoms associated with bony bars, fusion of the subtaloid and talonavicular joints seems to be justified, although Webster and Roberts [6] have suggested that in young patients without arthritis a bar may be resected. Only in the absence of a bony abnormality does conservative treatment offer a reasonable prospect of success.

1. Sloman, N. *J. orthop. Surg.* 1921, **3**, 586.
2. Badgley, C. E. *Arch. Surg.* 1927, **15**, 75.
3. Harris, R. I., Beath, T. *J. Bone Jt Surg.* 1948, **30B**, 624.
4. Lapidus, P. W. *Ibid*, 1946, **28**, 126.
5. Blockley, N. J. *Ibid*, 1955, **37B**, 191.
6. Webster, F. S., Roberts, W. M. *J. Amer. med. Ass.* 1951, **146**, 1099.

BIRTHDAY HONOURS

IT is a pleasure to record the high distinctions conferred on Sir Horace Evans and Sir John Charles for two kinds of service to the Crown, and the additional honour given to Sir Alexander Macgregor, whose work for Glasgow has continued since he ceased to be medical officer of health and became chairman of the Western Regional Hospital Board. Of the new knights Mr. Geoffrey Keynes, of St. Bartholomew's Hospital, has contrived to be both man of letters and man of action: as a surgeon, a scholar, and a person, he has long since been accorded knighthood in the minds of his fellows. Next year he will be visiting Canada and Africa as a Sims Commonwealth travelling professor—an office held in 1952–53 by one of the three new Australian knights, Prof. H. R. Dew of Sydney, whose scientific reputation was first gained by his studies of hydatid disease and malignant disease of the testis. Mr. A. E. Coates, of Melbourne, is likewise a surgical teacher, with special experience of vascular surgery and with a record of war service extending from Gallipoli to Japanese prison camps; while Dr. D. R. W. Cowan, consulting physician to the Royal Adelaide Hospital, is an authority on tuberculosis. These are but a few of the notable names appearing in the list which we publish on p. 1266—a list impressive once again in the immense range, both geographical and professional, of the valuable medical work it brings momentarily into view.

Dr. D. B. BLACKLOCK, emeritus professor of tropical hygiene in the University of Liverpool at the Liverpool School of Tropical Medicine, died on June 10 at the age of 76.

Dr. REDCLIFFE SALAMAN, F.R.S., formerly director of the Potato Virus Research Station at Cambridge, died on June 12 at the age of 80.

PRICE OF THE LANCET

As we announced with regret on April 23, the price of THE LANCET will be raised at the end of this month. Any reader (at home or abroad) renewing his annual subscription on or after July 1 will be asked to pay £3 3*s*. (reduced to £1 11*s*. 6*d*. for medical students, for doctors within a year of qualification, and for those undertaking National Service in H.M. Forces). The rates for the air-mail edition will be £1 1*s*. higher than at present.

Special Articles

THE YOUNG LONG-STAY PATIENT IN HOSPITAL

M. U. SHARP
M.A. Camb.
MEMBER OF ASSOCIATION OF GENERAL AND FAMILY CASE-WORKERS

AT the request of the South East Metropolitan Regional Hospital Board, an investigation was made during 1953–54 into the position of young long-stay patients in hospitals in south-east London and the counties of Kent and East Sussex. The purpose was to discover how many such patients there were, and whether the hospital arrangements, so far as their welfare or social life was concerned, were adequate and satisfactory. The age range taken was 15–45 years inclusive, and the only illnesses excluded were pulmonary tuberculosis, carcinoma, epilepsy, blindness, mental defect, and psychosis.

INVESTIGATION

Thirty hospitals reported having in all a total of 96 patients (47 men and 49 women).

Of these, 17 (6 men and 11 women) were in acute wards, but only 13 were undergoing treatment; 31 (23 men and 8 women) were in wards for young chronic patients; and the remaining 48 (18 men and 30 women) were in wards for elderly chronic patients where 3 of them were receiving treatment.

Of the 17 patients in acute wards, 13 were correctly placed according to their needs: 5 in the Chailey Heritage Craft School, 4 cases of poliomyelitis in appropriate hospitals, and 4 others undergoing active long-term treatment. The remaining 4 were untreatable.

Four hospitals, between them, have been able to accumulate 31 young patients together, often by exchanging them with elderly patients. This left 48 cases in wards for the elderly chronic sick, and 4 other cases in acute wards not receiving treatment who could be regarded as being unsatisfactorily placed.

Most of the 96 patients have been in chronic sick wards for three years or more, 4 men and 1 woman having been in for over ten years each. No less than 69 of the patients (32 men and 37 women) fall into the age-groups 35–45 years; 12 (9 men and 3 women) were aged 15–24, and 15 (6 men and 9 women) were aged 25–34: 58 of the 96 cases (60%) suffered from diseases of the nervous system, of which disseminated sclerosis was the commonest with 12 men and 15 women. Diseases of the bones and joints and muscles accounted for 13 cases, infective and parasitic diseases for 11, and congenital malformations for 7.

PROPOSED DISPOSAL

There were 52 young patients for whom more satisfactory arrangements could be made. No immediate change could be offered, but attempts were made to discover what their own wishes were. It was found that 24 (8 men and 16 women) would like to be moved, while 21 (12 men and 9 women) would prefer to remain where they were. A further 4 women were in any case too ill for transfer and 3 women were undergoing treatment in chronic wards for the elderly.

The immediate need is thus to find some happy solution for the 24 patients who wish to be moved; but it would be wrong to write off the others as happy and satisfied with their surroundings. The reasons given for not wishing to be moved were: nearness to relatives (10); a preference for the known to the unknown (9); a wish not to lose the friendship of the patient in the next bed (2). This does not necessarily imply that the best is being done for these patients, or that they would not have chosen to go elsewhere had a more suitable offer been made at the time of admission.

The solution for those who wish for a move does not lie in providing wards for 8 men and 16 women: the problem is far more complex. The 8 men are at present in eight hospitals and the 16 women are in ten hospitals scattered throughout the region. In only two instances are any 2 of the women in the same ward; for some are light and some are heavy cases and they are distributed accordingly. Again, patients who wish to leave their present surroundings do not all wish to be far removed from their home district. It must also be borne in mind that patients in the early stages of disseminated sclerosis would find it very depressing to be close beside those in the advanced stages. It would be easy, too, for someone with a difficult or abusive temperament to wreck the happy atmosphere of a ward. Care must therefore be taken in the initial stages of building up any unit for the young.

But it would not be right to emphasise the difficulties without also stressing the urgent need for better provisions for these young patients. Two case-histories may speak for all.

Case 1.—A spastic of 38, severely handicapped in his legs, but with use of his hands and very alert mentally. His father was a professional man, and he was used to life in a comfortable home until he was placed in a sheltered workshop. He was later transferred to the chronic ward, to be the only young one among the old men, with no outlet for his intellectual interests, and only handicrafts with which to occupy his time.

Case 2.—A woman of 25, bedfast with disseminated sclerosis, who, because of the degree of nursing care required, is placed in the ward with the very elderly and senile patients. Her hands are too shaky to do more than a little knitting, and her sight is too much affected to make reading possible. She is beset with worries about her husband and small boy at home, and has nothing to take her mind off her troubles as she gazes idly round the dreary ward, full of those nearing their journey's end.

THE SCHOOL-LEAVER

The Ministries of Health and of Education combine to offer the severely handicapped child nursing, and schooling in a suitable environment; but what provision is there for him if further institutional care is essential, or if his home is inadequate to deal with his needs when he has to leave at the age of 16? Is the chronic ward the only answer which the Welfare State can give?

Case 3.—A boy was at grammar school when he caught poliomyelitis; it left him paralysed in all limbs, with the exception of his right foot, tips of fingers, neck and head muscles. Much effort was necessary before he would face life again and find in it some compensation for all he had lost. He can write now with a pen in his mouth and is learning remote-control typing, and it is possible that he may be able to sit for part of his General Certificate of Education shortly. But what of his ultimate future? Where can he go in order that he may use his intellectual gifts, since illness has deprived him of his physical powers?

I made some further inquiries both from education authorities and from voluntary bodies which specially cater for the education of handicapped children and I found 9 severely handicapped children, aged 15–16 years, who are receiving special-school education. It is thought that 6 of them will be unable to receive sufficient care at home on leaving school, the cases of the other 3 being doubtful. In addition I found 5 16-year-olds in hospitals in this region, and a further 4, belonging to this region, in the children's hospital of a neighbouring region. These 18 young people suffer from a variety of diseases: muscular dystrophy (5 boys); cerebral palsy (2 boys, 2 girls); poliomyelitis (1 boy, 2 girls); fragilitas ossium (2 girls); spina bifida (2 boys); hydrocephalus (1 boy); Friedreich's ataxia (1 boy).

Of 8 difficult-placement cases who left Chailey Heritage in the last three years, 3 went to other hospitals for further treatment, and 5 to accommodation provided by voluntary societies. This may sometimes be the best

solution, but there is a great lack of such voluntary homes, and the waiting-lists are long.

A spastic girl of 16, leaving a special school, was sent into a private hospital run by a sisterhood, and a boy with spina bifida has been in a chronic ward for four years, since he left school. Yet another, with muscular dystrophy, now aged 18, has been in a chronic ward for two years, but fortunately with a few others aged 16–45. This hospital has accepted another muscular dystrophy patient aged 16.

All in close touch with this problem are concerned at the lack of suitable provision for this class of youngster.

POTENTIAL LONG-STAY PATIENTS

During 1952–53 I made a survey, under the Leverhulme Research Awards, into the social problems of disabled persons living in Kent, in the 15–45 age-groups. Of 340 persons visited in their own homes, I found 42, aged 25–45, who either by reason of failing relatives or of progressive disease, might be expected to require hospital admission within the next five years. Of the 42, 19 were cases of disseminated sclerosis, and another 10 had other progressive diseases; 20 of the 42 were living with elderly parents, and 3 were living alone; the others were looked after by husband or wife.

Older patients (aged 45–55) in chronic wards also deserve attention, especially those who are mentally alert: 11 men and 23 women were specially referred to me because of their mental alertness, and there would undoubtedly have been more had I been looking for them. If in planning for the future these patients are considered, with the younger ones, the numbers to be catered for will be much higher than those suggested by this survey.

DISCUSSION

Young long-stay patients are not only patients: they are also human beings with diverse needs in the way of companionship, interest, occupation, and (perhaps the most fundamental need of all) the feeling of being "wanted" and of being some use in the world.

I found that doctors, nurses, and almoners all agreed that it is not right to allow the young to remain indiscriminately with the old; but there was no uniform opinion as to how the problem should be tackled. There is little, if any, spare money to use in the creation of anything new. A few hospital management committees have made a start by gathering the younger patients together in one ward, often by exchange with older patients, but this in itself creates difficulties because such young patients are likely to occupy their beds for many years; hence they reduce the number of active beds in the hospital.

In other hospitals the answer has been to place the patients in acute beds; but should the prevailing atmosphere, for the long-stay patient, be that of a busy acute ward? In chronic wards, however, he is usually surrounded by the old, the incontinent, and the dying. The fact that one man, now aged 40, has become so used to his surroundings, after thirty bedfast years, that he does not want to be moved, does not prove that present accommodation is adequate: but rather it shows that the power of adjustment in human beings is infinite.

What type of accommodation is most suitable for the young long-stay patient and what is available for him? What better use can we make of the resources at our disposal?

Is the answer to be found by grouping the young together within the curtilage of a general hospital with full ancillary services, where they have the chance of active treatment and rehabilitation? But what if this ends in transfer, within the same hospital, to a geriatric ward when the "young" grow "old"? Is it possible to bring in even more outside life than is at present done, so that the young patient may feel he belongs to the community outside, not only through their visits to him, but by his excursions into the normal world of social life, sport, and church worship? If that is the answer, should there be several small units in each region, to allow of reasonable access by relatives? Or should there only be one or two, in which resources can be pooled? How is a balance to be struck between the needs of the "difficult" and the very ill patient, and those of the other patients in a ward? Is a person to be judged as "young" by his date of birth or by his mental alertness, and at what age does he become "old"? What can be offered to the 16-year-old? Are there any improvements which could be introduced, here and now, by those hospitals which already accommodate young long-stay patients?

Finally, is this problem so widespread, that it should be considered for the country as a whole instead of being tackled by hospital management committees and regional hospital boards? Though widespread, it is perhaps not a large problem: it need not call for the expenditure of large sums of money. But it does call for the free use of knowledge and imagination so that these young long-stay patients may have some chance to live the richer, fuller life which is surely their due.

"MINOR" ADDICTIONS

Barbiturates, Methylpentynol, Tobacco

ON May 23 the Ciba Foundation devoted a quarterly clinical forum to Major Consequences of Minor Addictions.

Dr. H. PULLAR-STRECKER (hon. secretary, Society for the Study of Addiction) said that the World Health Organisation's expert committee in 1950 and 1952 recognised three groups of drugs:

1. *Addiction-producing.*—Some drugs (notably morphine) have a specific pharmacological action which will always produce compulsive craving, dependence, and addiction in anybody. With these drugs pharmacological action is paramount, psychological make-up adjuvant. Such drugs cause individual and sociological damage.

2. *Habit-forming.*—Other drugs never produce compulsive craving, yet their pharmacological action is found desirable to some individuals to the point that they readily form a habit of administration—a habituation. Administration can be interrupted without significant disturbances. With them the psychological make-up is paramount, pharmacological action adjuvant. They cause no sociological damage.

3. *Intermediate.*—The pharmacological action of some drugs is intermediate in kind and degree between groups 1 and 2. Compulsive craving, dependence, and addiction can develop in persons whose psychological make-up leads them to seek and find escape in drugs. Psychological make-up is the determining factor, but pharmacological action plays a significant rôle.

He himself prefers to classify them as (1) essentially malign, such as narcotics; (2) potentially malign, such as barbiturates and alcohol, and (3) essentially benign, such as tobacco. But they can be compared according to various different criteria. For instance, in terms of what people will pay to get their drug, narcotics come first, with tobacco a close second: on the Continent after the late war there was hardly anything people would not and did not give in exchange for cigarettes. But the hallmark of an addiction is the suffering entailed when it is unobtainable, which is worst with narcotics and really quite bearable with tobacco. Another criterion is the difficulty entailed in discontinuing the drug by one's own unaided efforts—a difficulty by no means insuperable with tobacco. In social effects—the extent to which it cuts across family life, work, duties, obligations, reputations, and so on—alcohol is easily worst, followed by narcotics and barbiturates. Tobacco does not figure here at all, and that is why, not so long ago, we were rejoicing over the inroads that tobacco was making on the consumption of drink. (Since 1900 the consumption of tobacco has increased two and a half times and the

consumption of alcohol has decreased to about half.) But unfortunately, now that the connection between smoking and lung cancer has become well-nigh inescapable, tobacco has displaced alcohol as the greatest danger to public health. By this criterion alcohol now takes second place, with barbiturates as the runner-up. Narcotics—perhaps because they are so well controlled in this country, or perhaps because the British as a nation are not given to addiction—is no public-health problem in this country.

But how, Dr. Pullar-Strecker asked, can the powers-that-be afford to discourage smoking when it brings the State £630 million a year in revenue—more than enough to defray the nation's entire health services? One suggestion might be to increase the taxation on pools and other forms of gambling: measured against the physical corruption of lung cancer, the supposed moral corruption of gambling appears almost a blessing; but the money obtainable would, he thought, be relatively negligible. In the fight against excessive drinking much has been done by taxation, closing-hours, and counter-attractions; but tobacco consumption would comfortably withstand a further increase in taxation, and the other remedies are inapplicable. There remains education, by which it might be possible to induce young people not to take up smoking. This should be done not so much by emphasising the potential danger as by making non-smoking worth their while. "In this world, you cannot make people think as you do, but you can make it worth their while to do as you think." With those who are smokers already, education will cut little ice.

BARBITURATE ADDICTION

Dr. R. A. HUNTER (York Clinic, Guy's Hospital) said that this century has seen a tremendous increase in awareness of psychiatric conditions, without an equivalent increase in psychiatric understanding. The general practitioner is in the unhappy position of being taught to recognise conditions which he is powerless to treat. What is he to do about the 50–75% of his patients whose symptoms seem to have their origin in the mind or emotional life? The answer, of course, is drugs—sedatives, hypnotics, and stimulants. In the U.S.A. in 1948 enough barbiturate was manufactured to provide every inhabitant with about 30 grains a year. In this country in 1949 almost 10% of all the drugs prescribed under the National Health Service were barbiturates, and today 15% would be nearer the mark. It is therefore surprising that the dangers of this group of drugs are so little recognised.

A great deal of chronic invalidism is caused by the liberal prescription of barbiturates for minor physical and psychiatric symptoms, because suppression of symptoms is mistaken for treatment. In milder cases with regular dosage and unfailing supplies withdrawal symptoms hardly appear; but, if they do, it is in the form of exacerbation of the original symptoms for which the drugs were prescribed, and accordingly their significance as signs of a barbiturate habit is not appreciated by either doctor or patient. Though it has been thought that tolerance to barbiturates does not develop, its existence is shown by the many patients who take barbiturates in hypnotic doses in the daytime without producing sleep—simply in order to keep going. Psychical dependence will develop in about a month if the patient is given a barbiturate at night with two or three smaller doses during the day. Physical dependence is best demonstrated by abrupt withdrawal of the drug, sometimes undertaken on admission to hospital so that the patient's psychiatric condition can be followed without masking of the symptoms by drugs. In patients who have been on barbiturates, such withdrawal may cause insomnia for as long as five days besides severe anxiety symptoms. But once over this stage many are well enough to leave hospital: in the words of Sir Samuel Wilks "the mere absence of treatment by physic is often a positive stage towards cure."

Many patients and their doctors are not aware that the original symptoms are maintained by the treatment. While the barbiturates act, these symptoms are inhibited; but each time the effect wears off they return. At first it is only the contrast between being with and without the symptoms that makes the patient go on taking the drug; but in time the symptoms of abstinence are added, so that when the drug wears off the patient is left with his original depression, insomnia, and anxiety, plus the same symptoms produced by the temporary withdrawal of barbiturates in the intervals between doses. The vicious circle of increasing and more frequent doses has started, and finally the confusion of barbiturate intoxication is superadded. Thus a mild psychiatric disturbance, amenable to one or two psychotherapeutic interviews, is converted into a serious condition. Patients who would not otherwise have done so may be driven to attempt suicide, and are at this stage often diagnosed as suffering from endogenous depression and subjected to electro-convulsions. If the cause remains unrecognised, leucotomy may be performed for what was originally an iatrogenic state of barbiturate intoxication, or a state of addiction which went unrecognised.

In conclusion Dr. Hunter said that "to assess the danger of barbiturates is not to despise them. I would simply plead for fewer drugs and more understanding of the patient's mind."

STIMULANTS AND DEPRESSANTS

Dr. A. D. MACDONALD (professor of pharmacology, Manchester) thought it would be odd if the synthetic chemist did not try to produce better stimulants and more controllable depressants than the caffeine and alcohol so long used by mankind.

Among stimulants the amphetamines stand out head and shoulders: their value against fatigue and mild depression has been established and the likelihood of addiction is lessened by their being more efficient when used occasionally than when used regularly. Amphetamine is also offered in combination with phenobarbitone and mephenesin, and these cocktails in tablets have fascinating pharmacological possibilities. The presence of schedule IV poisons does not prevent a demand for them with which the manufacturers (he was told) cannot keep pace.

Methylpentynol was introduced in America in 1951 as a short-acting hypnotic but is now advertised here for the "emergencies" of daily life—public speaking, interviews, examinations, visits to the dentist. Trotter[1] reported that in the recommended dosage its effect on behaviour was negligible. Similarly, in a test of accuracy in adding numbers, Professor Macdonald found, on the average, little change—performance being 5% better after amphetamine (10 mg.), 6% worse after alcohol (2 oz. 40% *v/v*), and 8% worse after methylpentynol (500 mg.). But in two out of fifty students performance was 40% worse after methylpentynol, and in a test with dummy capsules he found it easy to tell which students had had the drug. People who take the drug may exceed the recommended dose, and it is not surprising that there have already been charges of car-driving "under the influence." A young man who took seven capsules awaits trial for manslaughter. Yet the drug is still unscheduled and advertised as safe and harmless.

The potential value of drugs which will relieve anxiety states, and even the milder forms of nervous tension, is enormous, said Professor Macdonald. But in his opinion their use and advertisement without medical control and without restriction is to be deplored.

1. Trotter, P. *Lancet*, 1954, ii, 1302.

TOBACCO

Miss FLORA BECK (almoner, General Infirmary, Leeds) said that for the occasional smoker the aroma of tobacco and a faint dulling of emotional awareness provide a small distinctive addition to the pleasures of relaxation, but the physical and emotional effect is small. Under social pressure, however, it is easy to become acclimatised to smoking more heavily, and after a day's abstinence the first cigarette gives a feeling of physical and emotional relief of a kind and degree which is new. At this stage the body has readjusted to neutralise the effect of a constant overdose of nicotine; to go without smoking upsets what has become its normal state; and an artificial craving has been induced. Satisfaction of this craving gives a feeling similar to the normal satisfaction of some primary need; and where deprivation and frustration are present they can be superficially allayed in this way.

"A need for affection, a need for food, a need for physical activity, a need for rest, a need for intellectual stimulus, a stirring of the spirit—all these, after a time, may be falsely decoded in the mind and presented to consciousness as one single simple cry: 'I want a cigarette.' The cigarette does give satisfaction. The duped conscious mind assumes that all is well. . . . In this way a tiny physical 'addiction' can become the focus for powerful inner drives—and it deflects them away from the constructive attempt to satisfy real needs."

Mass addiction to tobacco represents a vast drain on personal and national income, and does much to perpetuate the ills it claims to relieve. What can be done about it? The example of light smokers or non-smokers carries more conviction with the average smoker than rabid anti-smoking speeches. Though it is important to broadcast the dangers of smoking, this should be done rather to reinforce a positive policy than to frighten people off. Life is *pleasanter* when freed. A general trend in public opinion slightly against smoking would have a big effect, and in a general campaign the person to aim at is the "floating smoker."

The really habituated smoker, if he is to change, must *want* to control or give up smoking. He may then adopt one of three methods:

1. *Cut off completely and for good.*—Some do this and after a few weeks are no longer bothered at all. But where a psychological urge has been built up, this method may leave a permanent feeling that some tremendous pleasure has been renounced. This may bring fear of relapse, and the whole subject of smoking remains disturbing.

2. *Reduce by rationing.*—This needs a less drastic act of will at the start but constant lesser self-control. After readjustment, physical craving will be satisfied at a lower level.

3. *Start by stopping completely (if possible for at least three weeks); then smoke for a few days and give it up again.*[2]—During abstinence, when the physical craving has died down, the psychological urge is still building up. Smoking comes as an anticlimax: the expected strong satisfaction is not felt, and will not be, unless smoking is continued long enough to induce a physical craving again. It takes numerous repetitions of this to undo the conditioning which associates smoking with strong satisfaction; but the tendency to translate any inner tension into the feeling "I want to smoke" gradually dies out.

Whereas the mild physical "addiction" to smoking can be cured in a few weeks, it takes months or even years to rub out the mental habit pattern. "It is obviously much better," said Miss Beck, "never to become addicted. Those who take care not to exceed 10–15 cigarettes a week can safely enjoy smoking, if they wish, without fear of the habit taking charge."

2. In first describing this method (*Lancet*, 1953, ii, 392) Miss Beck recommended that after the period of abstinence, one should smoke so heavily as to induce aversion. This she now thinks unnecessary.

In the discussion Dr. HORACE JOULES said that, though it is estimated that a million people in England and Wales will die from carcinoma of the bronchus before the end of the century, he is even more concerned at the 30,000 deaths annually from chronic bronchitis, preceded by long years of discomfort and disability, which would be largely prevented if people would stop smoking. He accused the Ministry of Health of failing to tell the public about the harmful effect of tobacco, and he praised the *Journal of the American Medical Association* for refusing to accept tobacco advertisements. Prof. F. R. WINTON spoke of the difficulty of preventing maladjustment and frustration in people who find life in modern communities unsatisfying, and referred to the decline of religious institutions. Addictions would vanish if psychiatrists could cure the disorders underlying them. Prof. W. D. M. PATON questioned whether we are tinkering with the surface of a deep human need, which would express itself in some other way if addiction were abolished. We should address ourselves to the nature of this fundamental need. Dr. A. LEVENE thought it would be instructive to make a study of the 10% of people *not* addicted to tobacco. Addiction to barbiturates or to methylpentynol is doctor-made, and therefore a different problem from smoking. Dr. KEITH SIMPSON said that, given the opportunity, any nation is a nation of addicts. Tobacco and alcohol are minor addictions in adolescence, but may lead to major addictions such as marihuana, "goof pills," or heroin. Experience has shown that placing a drug on schedules I or IV cannot be relied on to prevent its abuse. Dr. PULLAR-STRECKER referred to the addition of ipecacuanha to barbiturates, so that an overdose will cause vomiting, and predicted that pharmacologists will eventually devise means of making barbiturates addiction-proof.

BIRTHDAY HONOURS

THE list of honours published on June 9 contains the names of the following members of the medical profession:

G.C.V.O.

Sir HORACE EVANS, K.C.V.O., M.D. Lond., F.R.C.P.
Physician to H.M. the Queen.

K.C.B.

Sir JOHN CHARLES, M.D. Durh., F.R.C.P.
Chief medical officer, Ministry of Health, Ministry of Education, and Home Office.

K.B.E.

Sir ALEXANDER MACGREGOR, O.B.E., M.D., LL.D. Glasg., F.R.F.P.S., J.P.
For services to public health in Scotland.

Knights Bachelor

ALBERT ERNEST COATES, O.B.E., M.D., M.S. Melb., F.R.A.C.S.
Stewart lecturer in surgery, University of Melbourne.

DARCY RIVERS WARREN COWAN, M.B. Adelaide, F.R.A.C.P.
Consulting physician to the Royal Adelaide Hospital.

HAROLD ROBERT DEW, M.B. Melb., F.R.C.S., F.R.A.C.S.
Professor of surgery, University of Sydney.

GEOFFREY LANGDON KEYNES, M.D. Lond., F.R.C.P., F.R.C.S., F.R.C.O.G.
Consulting surgeon, St. Bartholomew's Hospital.

C.B. (Military)

Surgeon Rear-Admiral SEYMOUR GROME RAINSFORD, D.S.C., M.D. Dubl.

Major-General ALBERT SACHS, C.B.E., M.D. Dubl., M.R.C.P., Q.H.P., late R.A.M.C.

C.B. (Civil)

WALTER ERIC CHIESMAN, M.D. Camb., F.R.C.P.
Medical adviser, H.M. Treasury.

C.M.G.

BENJAMIN KEITH RANK, M.S. Melb., F.R.C.S., F.R.A.C.S.
Chief plastic surgeon, Heidelberg Military Hospital, Victoria.

ALLAN ROBERT STANLEY VICKERS, O.B.E., CH.M. Sydney.
For services to the Flying Doctor Service in Australia.

C.B.E. (Military)

Air Commodore ALBERT FREDERICK COOK, O.B.E., L.R.C.P.I.

Brigadier ALLEN LEPARD CROCKFORD, D.S.O., O.B.E., M.C., M.B. Camb., Q.H.S., late R.A.M.C., T.A.

C.B.E. (Civil)

ROGER GILBERT BANNISTER, M.B.C.S.
For services to amateur athletics.

PHILIPPE LESLIE CARO CARRIER, M.D. Lond., M.R.C.P.
Senior medical officer, Home Office.

CHARLES WILLIAM ATKINSON EMERY, M.B. Belf.
Principal medical officer, Ministry of Pensions and National Insurance.

MARY ESSLEMONT, LL.D., M.B. Aberd., J.P.
General practitioner in Aberdeen; for services to medicine in Scotland.

RICHARD THOMAS BONDFIELD GREEN, M.D.
Senior bacteriologist, Institute for Medical Research, Federation of Malaya.

JOHN LEWERS GROVE, M.D. Melb., F.R.A.C.P.
Physician, Launceston Hospital, Tasmania.

JOHN ARTHUR LLEWELYN VAUGHAN JONES, M.B. Glasg., J.P.
For services to the Ministry of Labour and National Service.

WILLIAM CALDWELL MCCLELLAND, M.B. Melb.
For services to sport in Australia.

FREDERICK GRANTLEY MORGAN, M.B. Melb., F.R.A.C.P.
Director, Commonwealth Serum Laboratories, Victoria.

FREDERICK WILLIAM ROQUES, M.CHIR. Camb., F.R.C.S., F.R.C.O.G.
Consultant in gynæcology to the R.A.F.; obstetrician and gynæcological surgeon, Middlesex Hospital.

MAX LEONARD ROSENHEIM, M.D. Camb., F.R.C.P.
Professor of medicine in the University of London at University College Hospital.

JAMES LESLIE ALLAN WILL, M.B. N.Z., F.R.C.S.E., F.R.A.C.S.
Orthopædic surgeon, Christchurch General Hospital.

M.V.O. (4th class)

Lieut.-Colonel WILLIAM HILGROVE LESLIE MCCARTHY, D.S.O., M.C., M.D. Dubl., M.R.C.P.

O.B.E. (Military)

Lieut.-Colonel GEORGE GREGG, M.D. Belf., F.R.C.P.I., R.A.M.C., T.A.

Lieut.-Colonel WILLIAM MUIR STEWART, M.B. Belf., R.A.M.C.

Wing-Commander ALISTAIR ROBERT CAMERON YOUNG, M.R.C.S., R.A.F.

O.B.E. (Civil)

WILLIAM ROY BILLINGTON, M.D. Camb.
For medical services in Uganda.

ARTHUR DOUGLAS BRIGGS, M.B. Glasg.
Medical superintendent, Stobhill Hospital, Glasgow.

DAVID ERIC CAMERON MEKIE, M.B. Edin., F.R.C.S.E.
Professor of surgery, University of Malaya.

SIMON EZIEVUO ONWU, M.B. Edin.
Deputy director of medical services, eastern region, Nigeria.

EDWIN ALFRED TRIM, M.D. Camb.
Deputy director of medical services, Kenya.

M.B.E. (Military)

Major CLARK NICHOLSON, M.C., M.D. Glasg., R.A.M.C., T.A.

Squadron-Leader CHARLES GEOFFREY WHITE, B.M. Oxfd, R.A.F.

M.B.E. (Civil)

NEVILLE GEORGE DAVID CAMPBELL, B.M. Oxfd.
Medical officer, Sierra Leone.

DONALD GORDON DUFF, M.C., M.B. Edin., F.R.C.S.E.
Surgeon-superintendent, Belford Hospital, Fort William.

SAMUEL MAURICE BARKLIE HILL, M.B. Belf.
Regional medical officer, British European Airways.

JOHN TODD, M.C., D.F.C., M.B. Edin.
For medical and missionary services in Northern Rhodesia.

Public Health

LYMPHOCYTIC MENINGO-ENCEPHALITIS IN THE MANCHESTER AREA

J. O'H. TOBIN
B.M. Oxfd, Dip. Bact.
LECTURER IN BACTERIOLOGY, UNIVERSITY OF MANCHESTER

LYMPHOCYTIC meningo-encephalitis (L.M.E.) is a syndrome which is due to many different micro-organisms and which has been known by a variety of names since Wallgren in 1924 first drew attention to it as "aseptic meningitis." The six well-known criteria laid down by him for its recognition have been modified as knowledge of the syndrome has increased and as agents producing similar but clinically distinguishable features have been demonstrated. Wallgren (1951) noted over 20 viruses, spirochætes, yeasts, and protozoa as causes of L.M.E. Viruses are involved most often in this syndrome, poliomyelitis being generally considered the most important. However, a large proportion of cases diagnosed as non-paralytic poliomyelitis, even during an epidemic of this disease, are due to other identified and unidentified agents (Tobin et al. 1954).

Simple serological procedures are available for the diagnosis of infection with the widespread lymphocytic choriomeningitis, herpes simplex, and mumps viruses, for the leptospiræ, and for certain of the arthropod-borne varieties of encephalitis in those areas where they are known to occur. More extensive tests are required for the diagnosis of poliomyelitis, Coxsackie, and other viruses.

Few reports give any real picture of the incidence of the L.M.E. syndrome, or of its ætiological agents, because figures are based on selected groups of the population often scattered over large areas. Until L.M.E. is made notifiable any exact idea of its incidence will be unobtainable; at present it is necessary to draw inferences from those cases admitted to hospitals or from samples tested in virus laboratories (Afzelcus Alm 1951, Adair et al. 1953, Virus Reference Laboratory 1953, Gard 1954, Nilsby 1954). In this paper the results are reported of investigations on the viral ætiology of L.M.E. in one area served by a small virus laboratory.

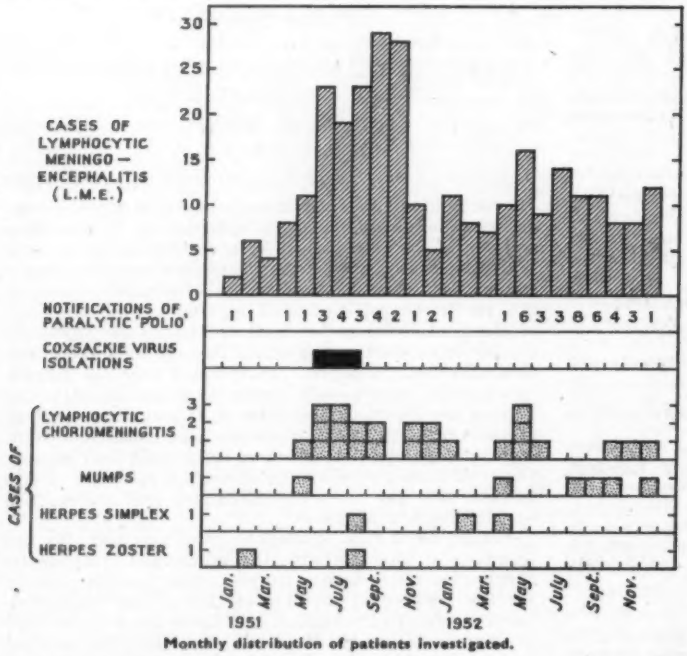
Laboratory Investigations

During 1951–52 samples for virus investigation were received from 291 patients in the Manchester area who were diagnosed as having non-paralytic poliomyelitis, aseptic meningitis, lymphocytic or serous meningitis, meningo-encephalitis, encephalitis, and choriomeningitis. As meningitis and encephalitis in such cases rarely occur separately, and as the pleocytosis in the C.S.F. is predominantly lymphocytic, these syndromes have been referred to in this paper as lymphocytic meningo-encephalitis.

Samples were received throughout both years with a peak during the summer and autumn of 1951 when the syndrome was encountered more frequently than normal by local physicians. The number of patients from whom specimens were received is illustrated by the accompanying figure, which also indicates when cases due to the test viruses occurred. Each patient was investigated for the rôle of one or more of the following viruses in the ætiology of this syndrome.

Lymphocytic Choriomeningitis

291 cases were examined by the complement-fixation technique for specific antibody to this virus and occasionally by attempted isolation or by serum neutralisation tests in mice. A diagnosis of this disease, which can often be made on clinical and epidemiological grounds with considerable assurance, was accepted as being confirmed by either (1) a rising titre of complement-



Monthly distribution of patients investigated.

fixing or neutralising antibody, or (2) the presence of complement-fixing antibody together with isolation of virus from the cerebrospinal fluid, blood, or throat washings. 15 cases due to this virus were diagnosed in 1951 and 9 in 1952, 20 being in adults over fifteen years of age and 4 in children.

Mumps

273 cases were examined by either the complement-fixation test using allantoic fluid as source of virus antigen, or in a few cases by the hæmagglutination-inhibition test. A fourfold rise in antibody titre was considered diagnostic of this infection in two samples of serum, one taken during the acute phase and another during convalescence. Only 6 cases were due to this virus; but, as material was received only from patients who developed parotitis after the onset of the neurological signs or who had no parotitis, some cases may have been missed owing to lack of requests for serological confirmation. 2 cases were in adults and 4 in children.

Herpes Simplex

124 of the cases were investigated by the complement-fixation test using either antigen prepared from the chorio-allantoic membrane of infected chick embryos or from infected allantoic or amniotic fluid. The majority of these tests were kindly done by Dr. N. L. Modi. This test was used as a screen and a rising titre confirmed by the neutralisation test using the chorio-allantois of the developing chick embryo. About 15% of the sera reacted non-specifically with normal chorio-allantoic extracts, and these were also tested for antibody by the neutralisation technique. 3 cases, 2 in children and 1 in an adult, were found to be due to infection with this virus.

Encephalomyocarditis Group

41 sera were tested by the neutralisation technique using 100 ID_{50} doses of MM virus, the serum-virus mixtures being given by the intraperitoneal route in mice. In no case were antibodies to this virus found.

Coxsackie

During the summers and autumns of this period, one or more fæcal samples from 62 cases were investigated for "C" virus by the inoculation, either subcutaneously and/or intracerebrally, of suckling mice less than twenty-four hours old. Only 5 strains of virus were isolated from the 47 patients studied in 1951, and none from those in 1952. These were isolated from 4 patients, one being infected simultaneously with 2 "C" virus strains, and another who had a concurrent primary herpes simplex encephalitis. Another patient showed a significant rise in antibody to one of the "C" viruses during her illness. 3 group-B type-3 strains were found and 2 group-A, types 2 and 4, the latter being those associated with the dual infections.

Herpes Zoster

Although no methods were known for the cultivation of herpes-zoster virus in our laboratory at that time (Weller 1953), sera from 2 cases of herpes zoster with L.M.E. were investigated to exclude herpes simplex virus infection, because this virus has been isolated from zonal lesions (Beeuwkes 1939).

The above results are summarised in the table.

RESULTS OF VIRUS INVESTIGATIONS ON 291 CASES OF LYMPHOCYTIC MENINGO-ENCEPHALITIS

Test virus	No. of cases investigated			No. of cases positive			% of cases positive		
	Total	15 yr. or over	Under 15 yr.	Total	15 yr. or over	Under 15 yr.	Total	15 yr. or over	Under 15 yr.
Lymphocytic chorio-meningitis	291	152	139	24	20	4	8·4	13·2	2·9
Mumps	273	143	130	6	2	4	2·2	1·4	3·1
Herpes simplex	124	61	63	3*	1	2	2·4	1·7	3·2
Encephalomyocarditis	41	22	19	0	0	0	0	0	0
Coxsackie†	62	8	54	4	0	4	6·5	0	7·5

* Including one case from which a "C" virus was also isolated.
† Diagnosed by virus isolation or rise in specific antibody.

Discussion

In this series the proportion of cases shown to be due to specific viruses was small. Lymphocytic choriomeningitis, herpes simplex, and mumps infection accounted for approximately 7% of the cases in children and 16·5% in adults, while none was found to be due to the encephalomyocarditis group of viruses. Lymphocytic choriomeningitis was associated with the two localised endemic areas in Manchester noted by Duncan et al. (1951). Cases of this disease were generally clinically distinct from the other cases of L.M.E. in having a prodromal phase before the onset of meningitis and a considerable proportion of them having a low level of sugar in the cerebrospinal fluid, a finding observed by Duncan et al. (1951) and confirmed in the recent report of Adair et al. (1953) from the United States. The mumps cases, as would be expected, occurred when the disease was most prevalent. Although 3 cases of herpes-simplex infection occurred, this virus, and that of mumps, did not seem to cause as high a percentage of cases as in the series recorded by the American workers.

The work of Curnen et al. (1949) and Gabinus et al. (1952) has indicated that the B group of the Coxsackie viruses can cause L.M.E. and these viruses have been recovered from the cerebrospinal fluid of patients on two occasions (Gabinus et al. 1952, Hummeler et al. 1954).

Gard (1954) thinks that they are responsible for a large proportion of the cases of this syndrome in Sweden. However, no evidence could be found to suggest that they played any but a very small part as causal agents of L.M.E. in the Manchester area in 1951 when "C" viruses were known to be prevalent (Bury and Tobin 1952).

In 1951, the "C" virus isolations both from meningo-encephalitis and Bornholm disease cases occurred before the L.M.E. reached its peak, and both Gard (1954) and Curnen (1952) have noted that infections with these agents may anticipate the poliomyelitis season. Neutralisation tests with the types of "C" virus isolated and with three other types on the sera of patients ill in August to November confirmed that lack of isolation of these viruses then was due to their absence in the patients tested.

Lymphocytic choriomeningitis occurred more frequently in adults than in children—young housewives being the most usual victims—while the Coxsackie viruses were isolated from those in the younger age-group.

Serological studies using the HeLa cell-culture method described by Syverton et al. (1954) showed that poliomyelitis infection was present in the area. Of 11 individuals tested, 10 had antibody to type-1, 9 to type-2, and 7 to type-3 poliomyelitis virus. However, only 23 cases of paralytic disease were reported from South-East Lancashire in 1951 and 35 in 1952. The exact relationship of these viruses to L.M.E. cannot be decided until we know the results of investigations now in progress.

Although L.M.E. seemed to be more prevalent during the summer and autumn, a large proportion of the cases in this series occurred during the winter and spring; but until this syndrome is made notifiable much of its epidemiology will be shrouded in obscurity.

Thanks are due to the many physicians who sent in sera from patients under their care; to Dr. Sven Gard for the MM virus; and to Mrs. B. M. Snape for her valuable technical assistance.

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DENTAL CARE FOR MOTHERS AND CHILDREN

THE Ministry of Health has issued a memorandum on dental services provided by local health authorities. The memorandum has been prepared in agreement with the Ministry of Education. The following is a summary of its recommendations.

EXTENT OF THE SERVICE

A satisfactory service is defined as providing for the examination of every expectant mother and the periodical examination of pre-school children followed by the provision of any necessary treatment. Progress towards a comprehensive service of this sort has been made difficult by the shortage of dentists in the public dental service, but the numbers are now increasing and the Ministry suggests that authorities should review this part of their maternity and child-welfare service to ensure that they are making the best use of the available man-power and are making such expansion as can be financially afforded.

The object of treatment should be the conservation and retention of the natural teeth whenever possible, and all forms of treatment should be available apart from those for which reference to hospital is necessary. In a satisfactory service the number of teeth filled for expectant and nursing mothers and pre-school children should greatly exceed the number of teeth extracted. Only a few authorities have so far been able to achieve this standard.

PROVIDING THE SERVICE

A local authority is not fulfilling its duty by referring mothers and children to the general dental services for any necessary advice and treatment. The general dental services are, of course, available to the "priority classes" but some dentists are unwilling to treat small children and there is in any case no system for ensuring that these classes are put in a preferential position in relation to other patients. Mothers and young children do not form a sufficiently large class to justify an entirely separate dental service and the service should, therefore, be coördinated with the school dental service for joint use of staff and premises. Dental officers employed by the local health and education authorities should devote not less than one-eleventh of their time (i.e., one session of 3 hours in a 33-hour chairside week) to maternity and child-welfare work. This division of time should be applied even though for the present the full demands of the school and the maternity and child-welfare dental services cannot be met.

It is important that the dental part of the local health services should be directed by a chief dental officer, who should be the principal school dental officer. This officer should direct the work of the dental officers, train those who are inexperienced in the routine work of clinics, and be available for consultation. It would be part of his duty to advise the medical officer of health on dental factors in health education and to train other members of the health-department staff—e.g., health visitors actually engaged in this work.

Within the limits of expenditure available, some priority should be given to the provision of further clinics (some notes on planning are given in an appendix to the memorandum). Where existing clinics are not fully used, greater use can sometimes be made of them by the part-time employment of general dental practitioners on a sessional basis, a method which has enabled many authorities to provide in present circumstances a much more comprehensive service. Evening sessions might supplement or replace morning or afternoon sessions. This system has been used with success by a few authorities, and mothers welcome the opportunity of attending for treatment at a time when the father is usually able to look after the children.

So that they can spend the maximum time on operative surgery, dental officers should be relieved as much as possible of other duties. For this reason general anæsthetics should be administered by medical practitioners, if necessary engaged for this purpose on a sessional basis. Oral hygienists can also relieve dental officers of considerable routine work in scaling and polishing teeth.

Modern equipment should be provided so that as many patients as possible can be treated, and so that the inevitable strain of dental work, particularly with children, is minimised. X-ray units should be available to serve all clinics in full-time use. Arrangements can be made for outside technicians to construct dentures, crowns, or inlays. If over 400 dentures or orthodontic appliances are required annually, it may be advisable to consider setting up a dental laboratory and employing a dental technician.

COÖPERATION WITH OTHER SERVICES

Close coöperation with other branches of the maternity and child-welfare service is essential. It is important that women should obtain dental treatment in the early stages of pregnancy and those attending antenatal clinics

should be referred as a routine by the doctor or midwife to the dental officer, unless, of course, they prefer to make their own arrangements. It is often an advantage to hold antenatal and dental sessions at the same time. It is important to detect and treat slight defects early, and even if it is impossible to provide routine examination to all mothers, it should at least be provided for those undergoing their first pregnancy. Mothers attending child-welfare clinics should be encouraged to bring their children for regular dental examination and treatment from the age of $2^1/_2$.

DENTAL HEALTH EDUCATION

Education about dental health should be an essential part of the general health teaching programme. As part of this programme, dental officers should, when staffing considerations permit, visit antenatal centres where there is no dental clinic, to give group talks and be available for consultation by the patients. If oral hygienists are employed, an important part of their work is in dental education, and particularly in introducing young children to their first experience of dentistry. Health visitors should, of course, continue to include dental health education in their advice to mothers: they are in a particularly favourable position to advise mothers on the right types of food for children. They should be able to recognise the early development of habits leading to deformities of the teeth and jaws such as thumb, finger, or tongue sucking. Simple explanations of the cause of dental decay and the value of the filling of teeth as opposed to their premature loss should also be undertaken by them. Another appendix to the memorandum gives some notes on the means of promoting preventive dentistry to guide those undertaking these duties.

There are more opportunities for group teaching on dental care now that many health visitors give talks to groups of parents and others. At antenatal clinics mothers are usually ready to accept advice on the need for dental treatment. Home visits by the health visitor or midwife should ensure that the advice is carried out by treatment when necessary and in all cases by reference to hygiene and food value.

The Ministry of Health has produced a simple single-paged illustrated leaflet, suitable for the use of health visitors, which will be supplied free to authorities on request. The Ministry has also reprinted the 12-panel display set, *Take Care of Your Teeth*, first sent to all local health authorities in November, 1951. Copies of this set are also obtainable free. Details of these and other publicity material are given in a third appendix to the memorandum.

Infectious Diseases in England and Wales

Disease	Week ended May			
	7	14	21	28*
Diphtheria	4	9	17	10
Dysentery	862	1038	1232	1385
Encephalitis:				
Infective	2	4	1	2
Postinfectious	7	5	7	3
Food-poisoning	155	211	150	306
Measles, excluding rubella	19,496	20,384	23,655	25,470
Meningococcal infection	29	22	27	19
Ophthalmia neonatorum	34	45	31	64
Paratyphoid fever	9	12	7	10
Pneumonia, primary or influenzal	450	441	377	423
Poliomyelitis:				
Paralytic	14	11	16	12
Non-paralytic	10	5	3	13
Puerperal pyrexia	274	274	209	201
Scarlet fever	575	571	620	609
Smallpox	—	—	—	—
Tuberculosis:				
Respiratory	788	823	812	744
Meninges and C.N.S.	17	19	22	12
Other	93	108	90	85
Typhoid fever	3	2	3	1
Whooping-cough	1850	1805	1613	1455

*Not including late returns.

Poliomyelitis Vaccine

The United States Public Health Service last week issued a report on the Salk poliomyelitis vaccine.[1] The breakdown of the mass vaccination programme is largely attributed to the incompatibility of the original formula with mass-production methods. The experience of manufacturers showed "that the process of inactivation does not always follow the original concept" set out by Dr. Salk. The Federal government lacked "adequate" procedures for determining manufacturers' performance and control because there were insufficient statistical data or experience on which they might be based. The government's biological control arrangements have accordingly been reorganised, and a new Division of Biologics Standards has been created, with increased powers and facilities, to replace the Laboratory of Biologics Control that had been in charge of the clearance of the vaccine.

During manufacture, the report states, the formalin used for inactivation often failed to reach minute particles of live virus. The original safety tests were designed "primarily to demonstrate mass contamination resulting from accidents in manufacture and not small amounts of residual live virus which the process was believed to reduce to an immeasurably low and harmless level." Data obtained in a study of manufacturers' processes indicated that a single negative test (which was what the old safety standards required) was unreliable, and the minimum requirements were raised.

The report gives some reasons for believing that Cutter vaccine may have contained live virus.

"The interval between injection of vaccine and first paralysis in Cutter-associated cases ranged from five to twenty days. The median case occurred in the ninth day and the spread . . . was from six to fourteen days. This finding parallels the frequency distribution of incubation periods in monkeys infected by intramuscular injection of virus. Moreover the distribution of cases following the injection of Cutter vaccine is the expected distribution in a common-source outbreak of polio resulting from a single exposure to the infectious agent."

Another similarity to experience with monkeys was the "high degree of correlation" between the site of injection and the site of first paralysis.

In a letter accompanying the report, Dr. Leonard A. Scheele, the Surgeon-General, says that "events which in the traditional course of scientific development would have covered years were telescoped into months and, as a result, both successes and failures have been magnified. In the long run, however, the nation and the world will surely have gained from efforts to speed the availability of an effective immunising agent against this disease."

1. *New York Times*, June 10, 1955.

Parliament

The Queen's Speech

THE first session of the new Parliament was opened by the Queen on June 9. The Government have decided that the session shall continue for fifteen months, extending to the autumn of next year. It is hoped to place on the Statute Book some measures introduced but not passed in the last session, including the Road Traffic Act.

The gracious Speech announced that Bills would also be introduced to safeguard the health and provide for the safety and welfare of those employed in agriculture and forestry, to extend the period during which family allowances were payable for children who remained at school, and to reduce the pollution of the air by smoke and other causes. In the light of proposals recently agreed among the local authority associations the Government were examining the problems of local government in England and Wales with a view to introducing legislation on the subject. While maintaining a high rate of house building, the Government would encourage action to secure the more rapid clearance of slums in both town and country and to relieve urban congestion. Such legislation as might be found necessary

would be introduced to further these objects. Further consideration would be given to the composition of the House of Lords.

QUESTION TIME

Prohibition of Heroin

Replying to questions asking on what evidence the Ministry of Health held that an efficient substitute for heroin existed for the treatment of disease, and what consultations had taken place with medical practitioners before the decision to limit its manufacture to small quantities for scientific purposes, Mr. IAIN MACLEOD, Minister of Health, said that the British Pharmacopœia Commission were of the view in 1950 that suitable alternatives existed and deleted the monograph on the drug from the 1953 edition of the *British Pharmacopœia*. His Standing Medical Advisory Committee were consulted and endorsed this view. As a result Mr. Macleod had advised the Home Secretary that there was no obstacle from his standpoint to responding to the appeals of the World Health Assembly and Economic and Social Council to prohibit the manufacture of the drug. Replying to Mr. SOMERVILLE HASTINGS, he added: It is true that there are people who believe that for a limited range of afflictions there is no true substitute for heroin. The point is that we have to weigh that against the larger claim of playing our part in combating something which is a very substantial social evil all over the world, and although there may be very little evidence of addiction in this country, it is entirely desirable that, if we can get international agreement, we should prohibit the manufacture of the drug everywhere.

Mr. WALTER ELLIOT: Is it not a fact that the drug is really of great use in certain cases and cannot be dispensed with? Will the Minister bend his utmost efforts to ensuring that supplies are made available to reputable practitioners, as has previously been done with many drugs as dangerous as this one?

Mr. MACLEOD: I will gladly take that into account. All I can do is to take the very best advice that is available to me, which is that of my Standing Medical Advisory Committee, which includes the presidents of all the royal colleges, the chairman of the council of the B.M.A., the president of the General Medical Council, and many other people. Their view is surely one to which we must give the greatest attention.

Replying to a further question asking whether, in view of the protests of the B.M.A. and of the medical profession throughout the country against the threatened withdrawal of heroin, the Home Secretary would now permit the manufacture of the drug in limited quantities for use by medical practitioners, and subject to a ban on its export, Sir HUGH LUCAS-TOOTH, joint under-secretary of State for the Home Department, said that the council of the B.M.A. had asked the Home Secretary to receive a deputation on this subject and he had agreed to do so.

Poliomyelitis Vaccine

Replying to a question, Mr. MACLEOD said that a member of the staff of the Medical Research Council had just returned from a visit to the United States where he had been studying the latest developments in regard to poliomyelitis vaccine. His report was at present being considered.

Dr. BARNETT STROSS: Is it not a fact that some of the tragic results of the use of the Salk vaccine in the United States were due to the fact that the virus in the vaccine was not completely killed? If it is used here, may we take it that the greatest care will be taken to see that no such accident occurs?—Mr. MACLEOD: It seems probable that the explanation of the Cutter vaccine incident was that it contained live virus. We in this country will be content only with the very highest standards before we go ahead.

Royal Free Hospital Group Inquiry

Replying to a question, Mr. MACLEOD said that he had seen the report of the subcommittee of the board of governors of the Royal Free Hospital group set up to inquire into the procedure for dealing with casualties at the Hampstead General Hospital. He was informed that the report had been accepted by the board. They were satisfied that the procedure laid down was in itself satisfactory, if properly followed, and he saw no reason to differ from that view. What was needed was to see that it was properly followed, which he was sure that all concerned would now endeavour more than ever to do.

Medicine and the Law

A Difficult Transfusion

A RECENT inquest [1] investigated a death which followed an incompatible transfusion. The patient, a woman aged 54, was admitted to hospital with high intestinal obstruction, valvular disease of the heart, and auricular fibrillation; her blood-urea was raised. Operation relieved the obstruction, and a transfusion of two bottles was ordered. Two bottles of group-A blood were given to the patient, who was of group O; the next day she was found to be jaundiced and her urinary output decreased, but after a few days the jaundice faded and the urinary output increased again. Nevertheless the blood-urea remained high and the patient died 16 days after operation. At necropsy the kidneys showed chronic pyelonephritis, thought to be sufficient to account for the raised blood-urea, and the coroner accepted this view, agreeing that the blood-transfusion was not responsible for the patient's death.

The interest of this case lies in the difficulties encountered by the technicians in grouping the patient's blood. According to the local press report,[1] which is an unusually good one, a sample of anti-A grouping serum agglutinated a number of samples of group-O cells. The most likely explanation of this is that the particular tube of grouping serum used was contaminated by bacteria and had become pan-agglutinating—bacteriogenic hæmagglutination.

Friedenreich [2] has shown that a few strains of bacteria can modify cells so that they are agglutinated by all human sera, even those of group AB (the Hubener-Thomsen phenomenon or T-agglutination), while Grove and Crum [3] and Davidsohn and Toharsky [4] have described the reverse phenomenon, whereby a sample of serum becomes capable of agglufinating all human cells (H-agglutination, which has nothing to do with the rare antibody, anti-H).

It seems possible that in this case H-agglutination may have been responsible for the technicians' difficulty; the regional transfusion centre found nothing wrong with the serum, but it seems possible that they received not the actual tube of serum which had been used, but another tube containing a sample of the same batch of serum which had not been contaminated by the rare bacterium which causes H-agglutination. Anyone unaware of this variety of bacteriogenic hæmagglutination might assume that an unused tube of the same batch would be preferable to the almost empty tube which had caused the trouble.

The technicians also had difficulty in cross-matching blood of group A with the recipient's serum, but they ascribed this difficulty to the presence in the recipient's serum of macromolecular plasma substitutes, of which large volumes had been administered. One explanation is that they may have failed to distinguish between true agglutination (which was present) and rouleaux formation or pseudo-agglutination (which may also have been present) which often occurs when any blood-cells are mixed with macromolecular colloids such as dextran. This difficulty is well known, but Marston [5] has shown that it can be overcome by using the Sheffield technique [6] in which cells and serum are incubated for about 1½ hours, after which the supernatant is removed and replaced by an equal volume of 20% bovine albumin, the test being read microscopically 15 or 20 minutes

1. *Pembroke County Guardian*, June 3, 1955.
2. Friedenreich, V. The Thomsen Hæmagglutination Phenomenon. Copenhagen, 1930.
3. Grove, E. F., Crum, M. J. *J. Lab. clin. Med.* 1930, 16, 259.
4. Davidsohn, I., Toharsky, B. *J. infect. Dis.* 1940, 67, 25; *J. Immunol.* 1942, 43, 213.
5. Marston, N. A. *Lancet*, 1954, ii, 688.
6. Dodge, O. G. *J. clin. Path.* 1952, 5, 102.

later; and Bowley and Dunsford[7] recommend that in such cases the anti-globulin technique should be used.

Finally, having noted the difficulty in cross-matching, the two technicians decided that they must rely on the biological test: in this about 50 ml. blood is administered within 30 minutes, and if no reaction occurs during that time it is concluded that the blood is compatible. This procedure can be refined by comparing the bilirubin levels of pre-transfusion and post-transfusion samples of blood. The technicians might not have realised that many incompatible transfusions do not cause any immediate reaction; and it seems that they were unaware of the Sheffield technique and its use for recipients who have received macromolecular plasma substitutes. It is also probable that they were not familiar with the possibility of bacteriogenic agglutination. This is not surprising; for most technicians, and many pathologists who work outside transfusion centres, would be equally unfamiliar with these possibilities. Nevertheless, the situation of these technicians is one in which other technicians or junior pathologists may unhappily find themselves, and they should always have a chance of ready help from an expert. Under the circumstances the technicians in this case acted wisely, within the limits of their knowledge and experience.

Coitus Interruptus

The recent case of Knott *v.* Knott[8] raises again the troublesome question of how far the practice of coitus interruptus should be treated as a ground for dissolving a marriage. It is necessary in this connection to distinguish clearly between nullity and divorce. A decree of nullity may be obtained on the inability or wilful refusal of one of the spouses to consummate the marriage. It is still not clear whether insistence by the husband on coitus interruptus amounts to non-consummation. In the leading case of Baxter *v.* Baxter,[9] in which the House of Lords decided that insistence by the wife on the use of contraceptives did not amount to non-consummation, the question of coitus interruptus was specifically left undecided. Later that year (1948) Mr. Justice Finnimore, in the case of Grimes (otherwise Edwards) *v.* Grimes,[10] granted a decree of nullity on the ground that the practice of coitus interruptus contrary to the wife's wishes amounted to non-consummation. In a case decided only three days later—White (otherwise Berry) *v.* White[10]—however, Mr. Justice Willmer held exactly the opposite; coitus interruptus was not wilful refusal to consummate, although it might be legal cruelty if it resulted in injury to the wife's health.

Mr. Justice Willmer's decision was followed by Mr. Justice Hodson in the case of Cackett (otherwise Trice) *v.* Cackett (1950). His Lordship added that the court would be driven into an impossible position if it tried further to define what amounted to normal sexual intercourse between normally formed people; for, where a woman alleged that the man had failed to complete the sexual act, the court would have to inquire exactly at what stage emission took place or what degree of satisfaction was reached by the woman.

There the position with regard to nullity remains. Nevertheless, as suggested by both Mr. Justice Willmer and Mr. Justice Hodson in the cases just mentioned, a decree of divorce (as distinct from nullity) may be obtained on the ground of cruelty. Legal cruelty has been defined as conduct of such a character as to have caused danger to life or limb or to bodily or mental health, or as to give rise to a reasonable apprehension of such danger. A decree on the ground of coitus interruptus was in fact obtained in Walsham *v.* Walsham (1949); in that case the husband persisted in withholding full intercourse although warned by his wife and by doctors of the probable consequences for her health which did in fact ensue.

The new case of Knott *v.* Knott carries the matter a stage further, since in this case a divorce was granted although the husband had not been warned by doctors of the consequences likely to result to his wife.

The husband and wife were married in 1942 when she was not quite 17 and he was 22. She was of a sensitive disposition, more liable than most people to be affected by events, and she greatly wanted to have a child. The man was insensitive to the point of recklessness and did not want children. After marriage they had no home of their own but lived with her parents; there were long separations due to the war, from which he returned in 1945. During the ensuing years the husband often acted in an aggressive manner towards the wife and there were quarrels between them. In 1946 the wife was ill with tuberculosis. In 1953 the husband left the wife, who refused to follow him and continued to live in her parents' home. Throughout substantially the whole period of the marriage he had refused full sexual intercourse and had practised coitus interruptus against her will. He had not received advice from any doctor that the continuance of this practice would injure her health.

Mr. Justice Sachs held that the husband's conduct, viewed as a whole, amounted to cruelty; further, the refusal to allow the wife a child and the practice of coitus interruptus in disregard of whether it injured her health or not, coupled with the obvious injury to her health, amounted to cruelty even though he had not been warned by doctors of the potential results. His Lordship said:

"I am not prepared to hold that his wife's deterioration in health was due to an active intent to injure his wife. I do hold that in determining to continue with coitus interruptus and in refusing to let his wife have children he was reckless of the effect on his wife and that his conduct was inexcusable . . . I would hold that for a man deliberately and without good reason permanently to deny a wife who has a normally developed maternal instinct a fair opportunity to have even a single child is of itself cruelty when injury to herself results and when the husband adopts a course which preserves to himself a measure of sexual enjoyment."

Refusal to have a Child

In another recently decided case—Forbes *v.* Forbes[11]—it was the husband who obtained the decree, it being held that the wife's conduct in refusing to have a child amounted to cruelty.

The parties were married in 1945; both were then about 26. Before the marriage the wife had never raised any objection to having children, and she knew that the husband was particularly fond of children. After the marriage the wife insisted on the use of contraceptives; at first the husband reluctantly agreed to use them himself, but later the wife herself used them. He attempted to persuade her to have a family, but she made various excuses and avoided discussing the subject as far as possible. On occasions she taunted him about his desire for children. By 1950, as a result of her refusal to have free intercourse, their relationship had become strained. In February, 1953, the wife for the first time definitely refused to have children and in November, 1953, the parties separated. By that time the husband was in a bad state of health as a result of her refusal to have children.

Mr. Commissioner Latey held that the wife's conduct had caused injury to the husband's mental health; her conduct was intentional in that she pursued it although she knew that her persistence was causing him anxiety and misery; accordingly she had been guilty of cruelty and the husband was entitled to a decree. In the course of his judgment the learned commissioner said: "Quite apart from the exhortation in the solemnisation of matrimony that, first, Christian marriage was ordained for the procreation of children, I cannot ignore the fact that it is a natural instinct in most married men to propagate the species and to bear the responsibilities and enjoy the comforts of their own children. If a wife deliberately

7. Bowley, C. C., Dunsford, I. *Lancet*, 1954, ii, 1080.
8. All England Law Reports, 1955, vol. 2, p. 305.
9. See *Lancet*, 1948, i, 38, 225.
10. *Ibid*, p. 883.
11. All England Law Reports, 1955, vol. 2, p. 311.

and consistently refuses to satisfy this natural and legitimate craving, and the deprivation reduces the husband to despair, and affects his mental health, I entertain no doubt that she is guilty of cruelty . . . "

It would appear that these words are subject to the qualification that the wife's refusal must be without justification. For, as Lord Justice Denning has said: "Where a man takes contraceptive measures against the will of his wife without reasonable excuse for so doing, it is easy to infer that he does it with intent to inflict misery on her; but when a wife takes contraceptive measures or asks her husband to do so, her conduct can often be attributed to fear of consequences to herself without any intention of injury to him." In the present case, however, the wife was on record as saying that she had no fear of childbirth, and the learned commissioner had no difficulty in finding that the wife's intentional acts amounted to cruelty.

Baby Sent Out Too Soon?

An infant who was discharged from hospital two days after birth died five days later from pneumonia. The inquest jury considered that the infant had been sent out too soon.[12]

The baby was born on May 15. On May 17 the hospital told the father that his wife and the baby were to be sent home that evening. They arrived home in an ambulance at 9 P.M. on a night when it had been snowing and it was cold, wet, and windy. The father said in evidence that he had taken every precaution in preparing and warming the room into which his wife and baby were taken. On May 20 the baby was ill and a doctor ordered his removal to hospital, where he died on May 22.

The mother said in evidence that she did not think that the child had on enough clothing when it was discharged; the baby seemed cold when they arrived home. A staff midwife said that she wrapped the baby in blankets, and thought it was sufficiently guarded against the weather. Asked if she approved of a baby going out of hospital so soon after birth, the midwife said that this was due to the bed situation; they could not do anything else. It would be ideal, she said, if there were bigger hospitals with better accommodation so that babies might be able to stay there for up to fourteen days.

Medical evidence was given that every precaution was taken with the child and that there was nothing unusual in discharging a healthy mother and child after two days.

Summing up, the coroner said it might strike the jury that once a decision to discharge the baby had been taken it was cast-iron and had to go through. "You may feel there is some lack of cohesion, coördination, or supervision on the part of the hospital staff."

Returning a verdict of death from natural causes, the jury added a rider that the baby was sent out of hospital too soon and that the standing order operative in the obstetric ward of the hospital regarding the discharge of mothers and such young babies be made more elastic.

Newspaper's Account of an Operation

In January a newspaper published[13] an account of an operation performed by a thoracic surgeon at the Churchill Hospital, Oxford. The surgeon objected to this article, which he had not in any way authorised. He objected not only on the grounds of unwanted publicity for his name and the inaccuracies in the article, but because he felt that the article might rouse unfair hopes in the minds of patients who might believe that they suffered from a similar condition. The Medical Defence Union accordingly instituted proceedings on his behalf against the newspaper, and its issue of April 24 contained a correction of the inaccuracies and an apology to the surgeon.

12. *Manchester Guardian*, June 7, 1955. *Birmingham Post*, June 4, 7, 1955.
13. *The People*, Jan. 9, 1955.

In England Now

A Running Commentary by Peripatetic Correspondents

INTERLUDE

The water murmurs beside me, murmurs ceaselessly
While I sit still, content,
My moment taken out of the current of time.
The dry stones of the rocky watercourse
Pale as bleached bones, are silent as time past
While the water murmurs. Through these pared stone
Bones of the land laid bare the river flows
Deep through the narrows, and spreads wide
Into a sheet of silken blue, spread at my feet;
Its satin smooth blueness frayed into purple,
Into the rough, purple splatches of shallows,
As I still sit, stilled in the moment between
Past and present. This is the moment of no momentum
Poised between memory of pleasure past
And foresight of delight.
So I sit relaxed, caressed by the sun and teased
By an easterly breeze, looking towards a steep hillside
Where tender green of the new grass and dusty pink of full-budded trees
Please my spring, sap-running senses. I see with approval
The sinuous strength of the tree that thrusts
Its dark twigs above me, thrusts them into the sky
With their gleaming golden spear-sharp buds
Held high, thrustingly overflowing with life. And the water murmurs.
Under the cover of ceaseless plasheling rushing
Comes softly a lazy, liquid gurgle,
An undertone, an aside of the lively river.
Over the colour, flickering lights of small wet boulders
Shine and signal their silent delights
While the water murmurs. And I sit still.

* * *

This year we sought sunshine and warmth in Spain and, as by-products, our search brought us one mild adventure and one diagnostic triumph.

The first began on a journey by bus to San Feliu: we were a willing audience to floods of abuse at the iniquitous charges of the bus from an elderly French couple and when in the evening we were taking tea on the pavement in the square they came up. They were not going back in the *maudit* bus; they had hired a boat, would we share it? It had a motor, oh yes! It would take only two and a half hours. Madame was the leader, firm and masterful. We agreed, but when we saw the boat we realised that our friends were not only enterprising but intrepid. The words of the Breton sailor's prayer came into my mind: "O God my boat is so small and Thy sea is so large." However, ashamed to jib, we climbed in. The sky was greying, the wind rising; the boat, overloaded with six adults (two crew) faltered at the start but after rounding the point chugged cheerfully along. We hugged the forbidding coast. Great cliffs towered above us. Pine trees grew in clefts of the rock, almost to the water's edge. We passed an occasional sandy beach at the foot of an olive grove, caves, islets, and one house perched on a height, and finally hauled up in our own bay before the hated bus could have arrived.

This led to our diagnostic triumph. The French couple invited us to tea. A Belgian lady came in distraught; her son, aged six, was very ill; he had developed a cough in the plane. The Spanish doctor had seen him in the morning and had given an injection of penicillin, but she could not understand what he had said about the diagnosis. Would the English physician tell her what was the matter with Alexander? I said doubtfully that I would try, realising that the Spanish doctor had probably temporised for lack of evidence. As I left the tea-table my surgical colleague, who can turn Centigrade to Fahrenheit in a trice, murmured "They say his temperature is 103°." Luck was with me—the child would not cough; there were no Koplik's spots, but as I was percussing his chest I saw a faint incipient rash and plumped for measles.

I described the course of the illness, outlined the régime, and left amid general satisfaction and relief with

the words "he will begin to be better in three days." My own relief was quite as intense when I learnt that the disease had played the game.

* * *

My morning paper comes from a northern city and is renowned for its clarity of thought and grace of expression. It even found its way regularly to London, to my smug satisfaction, when the London papers failed recently for a period to appear.

In a recent issue the last sentence in an article on Labour's likely investigations into its failure at the election read: "The post-mortem will undoubtedly be long, thorough, and not painless." Although I am not in the way of writing to editors I could not resist dropping a note quoting this, and, with my tongue in my cheek and a large exclamation mark at the end, saying that the idea that a post-mortem could be painful might deter many people and their relatives from allowing autopsies. I am not surprised that my letter was not published but a courteous assistant editor, a few days later, replied thanking me and pointing out that a post-mortem could cause pain to relatives.

Wondering whether it was worth arguing with this undoubtedly highly educated party as to what was the difference between pain and mental distress, I happened to take up the issue of the paper for that day and there, quoting Mr. Bevan from *Tribune* was the sentence: "It is, perhaps, inevitable for a post-mortem to be held on Labour's defeat, but those who hasten to take part in it should keep in mind that it is a living body they are about to examine."

I do not think I will bother with journalists' or politicians' ideas of post-mortems any more.

* * *

A somatotype of my acquaintance—a bit of an ectopene, actually—whom I met on the Heath while exercising our respective dogs, confessed to me that he had had great difficulty in remembering the physical and mental traits associated with the three standard types until he had related them to the canine world "whose characteristics," he added, "are so much better known to the average Englishman than those of his human associates. Take a pug," he said, "a typical endomorph! His podgy physique, love of good food—stomach before sex is his motto—and insistence on postural ease and comfort would rate him as a 711. The peke, with his bland and tolerant outlook and love of polite ceremony—I quote the literature—is another endomorph, though I admit that, confronted with a rabbit, he becomes pretty mesomorphic. The aggressiveness, the love of exercise, of action and even of combat, and the vehemence of expression (*Will* you stop barking, Spot!) mark the terriers as the supreme mesomorphs. And the greyhounds, collies, and red setters, with their linear outlines and speedy mental and physical reactions, fall naturally into the ectomorphs." "Thank you," said I, "for these hints. As a mesomorphic-ectomorphic-endomorph may I suggest that we now drop in to The Spaniards and have one?" "Willingly," he replied, "but meanwhile do not let us forget that there is an earlier and more elegant description of the type you have just mentioned; I mean, *l'homme moyen sensuel*."

* * *

News from School.—"I gained six pounds (weight unfortunately) in the holidays. Last night I attempted to ride a horse tethered in the Park. The horse however did not want to be ridden so after giving it about 10*s.* worth of sweets it kicked up various legs. And this somewhat dismayed me, so I continued on my way to the dreadful Entertainment. This was a Dutchman (Deutch) who could multiply 12-figure numbers together in his head. In the end the headmaster asked him to answer any questions that 'the boys may put.' He said 'No, I don't want to answer any questions, please may I go now?' The headmaster took no notice as the Dutchman had not a very good accent, so the headmaster repeated his request. The Dutchman said 'Thees vaas not on ze programme,' however, he wrote a lot of figures on the blackboard and asked us if we understood. We said that we did, and he rushed out."

Letters to the Editor

CHILDREN'S TEETH

SIR,—May I appeal to all medical practitioners, and through them to nurses and medical auxiliaries who have contact with children (and mothers), to emphasise the necessity of regular dental inspection and early treatment? The increasing number of cases where teeth of the permanent dentition are lost prematurely is appalling. We are creating daily more orthodontic and dental problems than our undermanned dental profession can hope to deal with. One wonders whether our educational system is lacking. Should not more attention be paid to teaching oral hygiene in the schools, since in many homes the parents are too ignorant or too apathetic to take an interest in their children?

When many of the present-day school-children become parents the whole sorry story will be repeated. Last year the British Dental Association presented a memorandum on child dental health to the Ministries of Health and Education, and it is to be deplored that the medical press have not seen fit to publish a résumé of this important document.

Prevention is the important aspect of the problem because owing to an increasing shortage of dentists we cannot give adequate treatment to all classes. The priority classes should, of course, have preference, but, pending national arrangements to secure adequate treatment of children, let us try to attack the problem by attention to diet and hygiene.

Selly Oak Hospital, Birmingham. EDWARD LINE.

*** The Ministry of Health has just issued a memorandum (prepared in agreement with the Ministry of Education), on the dental care of mothers and children. A summary appears on p. 1269.—ED. L.

PSYCHOSOMATIC DISEASES IN UNDERDEVELOPED AREAS

SIR,—Osler's remark that "As clinicians we observe the experiments of Nature," would seem to apply on a grand scale to Professor Davidson's observations (April 2) on the incidence of those diseases which are commonly called "psychosomatic." The evidence which he presents in his letter is of importance to all concerned with the problem of the ætiology of rheumatoid arthritis. As our findings here are somewhat similar to his own, they may be of interest to others working in the same field, as well as to politicians and health authorities engaged in the development of "underdeveloped areas."

In the Queen Elizabeth Hospital for Rheumatic Diseases, which is situated in a district with a large Maori population, we see very few Maori patients with rheumatoid arthritis. In the past year I have seen only 3, and it may be significant that all of them were either married to Pakehas, or had a history of previous neisserian infection, or both. The rarity of rheumatoid arthritis, and of other diseases commonly called "psychosomatic," amongst Maoris (in the areas away from the two largest cities in the North Island of New Zealand) is confirmed by several general practitioners with whom I have spoken, so that I am not inclined to think that my experience, based on hospital cases, is unrepresentative.

Hitherto it has not been easy to decide whether to attribute this great difference in incidence to genetic or to environmental factors. Now, in the light of Professor Davidson's observations, it would appear that environmental factors would be a more likely explanation than a genetically determined racial immunity.

He raises the question of the relative importance of metabolic and emotional factors in the ætiology of these disorders. Here one is on very uncertain ground, but emotional factors would appear to be frequently operative in initiating the

abnormal metabolic processes involved. Our experience of rheumatoid arthritis in patients here, accords very well with that of Professor Hartfall,[1] who found associated emotional disturbance in 68% of his series. According to Halliday,[2] one of the hallmarks of diseases of emotional origin is a tendency for the peak incidence to shift to an earlier age-group, and for the severity to increase, with continual failure of adaptation to environmental pressure. The observations of the distinguished physicians mentioned in Professor Davidson's letter could therefore be interpreted as supporting an emotional ætiology.

The Maori population is not as yet reacting with the same type of emotional disturbance, possibly because their culture is less competitive and because they are less exposed to "social isolation," especially when compared with Pakeha immigrants. This does not mean that the Maoris are immune from emotional disturbance, but only that it takes different forms. The present risk is that, in freeing themselves from the danger of "psychosomatic" death following infringement of a taboo, they may become more liable to peptic ulcers and to rheumatoid arthritis.

As it has taken less than forty years for this change to occur in the United States of America, it is of some importance to public-health administrators to know how to prevent a parallel change elsewhere, without sacrificing a high material living standard. In this respect it has been shown by LeCorbusier that it is not by any means necessary for a materially advanced culture either to cut itself off from the basic rhythms of nature, or to split itself up into a disintegrated state of individual social isolation, as is the present trend. These last remarks apply to the development of "developed" areas, but in dealing with "undeveloped" areas they might do worse than consult the UNESCO handbook, *Cultural Patterns and Technical Change*.[3] Consultation with a cultural anthropologist before initiating any major changes, such as housing schemes in new factory areas, could prevent major social disintegration, even if the Corbusian dream remains long unrealised.

Queen Elizabeth Hospital,
Rotorua, New Zealand. B. S. ROSE.

HYPERSENSITIVITY ANGIITIS

SIR,—In their article of June 4, Dr. Edge and his colleagues describe a case of polyarteritis which followed a typical and mainly progressive course, starting with lesions of the respiratory tract and ending with glomerular involvement and renal failure. The patient was treated successively with penicillin, streptomycin, isoniazid, and cortisone. They suggest that hypersensitivity to penicillin caused the disease, and that hypersensitivity to the other drugs aggravated it.

The theory that drug hypersensitivity can cause or aggravate polyarteritis is, except in the case of thiouracil, founded largely on observations of this sort. Such evidence is unconvincing for two reasons. Firstly, it is possible that the initial condition for which the drug was given may have been polyarteritis and not a simple infection. Secondly, even in the absence of any treatment the disease is liable to repeated exacerbations; it is therefore to be expected that the giving of drugs may often by pure coincidence be followed by deterioration.

In the present case, the authors date the onset of polyarteritis from the appearance of a skin rash and lung lesions, regarding the "otitis media" which preceded these as a simple infection. But experience strongly suggests that the "otitis media" in this case was due to specific granulomatous lesions and was thus a part of the polyarteritic illness. This is a not uncommon presentation in cases of polyarteritis with lung involvement. If this view is correct, then clearly the penicillin treatment of the ear condition did not cause the polyarteritis. During the subsequent course of the disease, the association between drug treatments and exacerbations of polyarteritis was no more than could be readily explained by chance. To infer a causal relation from such evidence is only to confuse our understanding of the disease, especially when the postulated causes are multiple.

Dr. Edge and his colleagues go on to argue that corticotrophin should be used rather than cortisone in the treatment of the disease. Their opinion is based firstly on reports of polyarteritis occurring in cases of rheumatoid arthritis treated with cortisone, and secondly on the observation of Rich and his co-workers of a peculiar form of glomerulitis in sensitised rabbits treated with cortisone. The first observation must be interpreted with caution, since rheumatoid arthritis quite commonly precedes polyarteritis even in the absence of cortisone therapy; and in the second instance it is unjustifiable to identify the experimental lesions with human polyarteritis. Cortisone has been used extensively in the treatment of polyarteritis, and I have personally had access (mostly through the Medical Research Council) to over 40 such cases without finding any evidence of its causing either hypersensitivity or renal damage. In adequate dosage (which may mean 500 mg. daily, or even more) it prevents the appearance of new lesions in nearly all cases. In these circumstances it seems reasonable to continue to use this form of treatment.

St. Mary's Hospital,
London, W.2. GEOFFREY ROSE.

LUNG CANCER IN ASBESTOSIS

SIR,—In your annotation of June 4 the final sentence poses an important question: "The dust diseases generally act on the connective tissues and there is no satisfactory explanation of why the asbestos fibres should affect the epithelium as well."

The answer to this problem may well be found in a consideration of the histology of human asbestosis. The essential pathological lesion in asbestosis is a fibrosis around the respiratory bronchiole with thickening of alveolar walls and included asbestosis bodies. Asbestosis bodies are found in the respiratory bronchioles and alveoli as well as interstitially. There is evidence to show that asbestosis is initiated by the inhalation of fibres whose length is between 20 and 50 microns.[1] The flexibility of such a fibre enables it to reach the respiratory bronchiole but its size renders removal by phagocytes difficult or impossible. Small asbestos particles and fibres under 5 microns can be engulfed by phagocytes and removed by lymphatic channels or dissolved in tissue fluids. Many long fibres penetrate the bronchiolar and alveolar walls, while others go through their characteristic changes in these epithelially lined spaces. As the pathological changes become more advanced there is much thickening of alveolar walls with imprisoned "clumps" of asbestosis bodies.

Gloyne stated[2]: "When the diffuse fibrosis has reached an advanced stage all alveoli in the area may be compressed out of recognition." Here surely we have an environment which allows chronic irritation by a fibrous mineral to epithelium. This irritation reacts on the epithelium in circumstances of increasing abnormality. The asbestosis body, moreover, is undergoing slow changes, well described by Gloyne,[2] which ultimately result in its disintegration. With the increasing fibrotic condition of the involved areas there is a possibility of a chemical effect on the tissues from the solution of the bodies in these abnormal conditions.

In view of these facts there would seem to be no lack of opportunity for the asbestos fibre, and bodies formed

1. Hartfall, S. J. *Brit. J. phys. Med.* 1955, **18**, 16.
2. Halliday, J. L. Psychosocial Medicine. London, 1949.
3. Cultural Patterns and Technical Change. Edited by Margaret Mead. UNESCO, 1954.

1. Vorwald, A. J., Durkin, T. M., Pratt, P. C. *Arch. industr. Hyg.* 1951, **3**, 1.
2. Gloyne, S. R. *In* Silicosis and Asbestosis. London, 1938; pp. 242, 234.

from fibres or chemical material produced by the disintegration of bodies, to affect epithelial structures in the lungs.

Rochdale. J. F. KNOX.

CYCLICAL VOMITING

SIR,—The letter of Dr. Millichap in your issue of Feb. 19, commenting on Dr. Wallis's paper (Jan. 8), and Dr. Wallis's subsequent letter (Feb. 26), gives the impression that most or all cases of cyclical vomiting are epileptic in origin. Some may be, but, lest all children who have the disorder be stigmatised as having epilepsy, accurate diagnosis is important. It should be pointed out that in certain cases, at least, no evidence of epilepsy is present. The disorder may recur in uniform episodes with remarkably regular periodicity for years, which is not characteristic of epilepsy. In some patients, cyclical vomiting persists or recurs in adult life in a different recurrent form. Such patients I regarded as having one of the bizarre forms of periodic disease of unknown cause.[1]

University of California-
University of Indonesia
Project in Medical Education.
Djakarta, Indonesia. HOBART A. REIMANN.

PROTEINURIA

SIR,—The work of Greiner and Henry,[2] to which you referred on June 4, may throw light not only on the mechanism of postural proteinuria but also on that of proteinuria in heart-failure.

On the basis of their own investigation and that of Farber et al.,[3] Greiner and Henry criticise the view [4] that postural proteinuria is due to increased renal venous pressure causing passive congestion of the kidneys. They refer to the work of Pappenheimer [5] and suggest, with regard to the intrarenal mechanism, that postural proteinuria is due to slowing of the glomerular blood-flow, resulting in an abnormal glomerular filtration of albumin, and to decreased tubular resorption of the protein in the glomerular filtrate. They attribute both factors to renal arterial vasoconstriction.

It is at present generally held that proteinuria in congestive heart-failure is due to passive venous congestion of the kidneys resulting from failure of the right ventricle. This view is based on the "back-pressure" concept of heart-failure. I have presented evidence, however, showing that proteinuria may result from left ventricular failure, and indicating that proteinuria in biventricular congestive failure is due to the failure of the left ventricle.[6] My findings appear to support the "forward-failure" concept of heart-failure, and perhaps signify that the mechanism of proteinuria is similar to that suggested by Greiner and Henry for postural proteinuria.

This possibility is strengthened by the occurrence, in postural proteinuria and in congestive heart-failure with a low or normal cardiac output, of certain other features in common, in addition to the protein in the urine. These are a decreased circulation-rate, stasis of blood in the legs, and oliguria. On the other hand, in congestive heart-failure with a high cardiac output, in which the circulation-rate and rate of blood-flow in the legs may be normal or increased, proteinuria [7 8] and oliguria [9] may be absent.

London, W.1. J. J. SEGALL.

1. *Arch. intern. Med.* 1953, **92**, 494; *Medicine, Baltimore*, 1951, **30**, 219.
2. Greiner, T., Henry, J. P. *J. Amer. med. Ass.* 1955, **157**, 1373.
3. Farber, S. J., Becker, W. H., Eichna, L. W. *J. clin. Invest.* 1953, **32**, 1145.
4. Bull, G. M. *Clin. Sci.* 1948, **7**, 77.
5. Pappenheimer, J. R. *Physiol. Rev.* 1953, **33**, 387.
6. Segall, J. J. *Med. Pr.* 1954, **12**, 273.
7. Segall, J. J. *Med. World, Lond.* 1952, **7**, 176.
8. Segall, J. J. *Lancet*, 1953, **i**, 524.
9. Fishberg, A. M. Heart Failure. London, 1940.

THE ACTION OF CHLORPROMAZINE

SIR,—I am glad that Professor Samson Wright (April 2) has given his opinion a priori on the "phenomena of Reilly": this letter showed how far removed the experimental facts are from traditional physiology, and therefore justified the importance we have for a considerable time attached to this study. His letter also showed the need to add a few complementary details, the development of which can be found in the works referred to by Dr. Buxton Hopkin (March 19).

I have suggested that the expression "phenomena of Reilly" should include all non-specific disturbances attributable to aggression of very different kinds (chemical, physical, bacterial, &c.); and I proposed this as a mark of respect to the chief of the school who, following others, undertook this study and who has done most to define these phenomena more precisely, to show their importance in the pathogenesis of many illnesses, and to indicate the primary rôle of the visceral nervous system in their development.[1]

Non-specific phenomena have been the subject of a great many researches in the past sixty years. At the beginning of this century the non-specific reaction of the adrenal cortex and medulla had been particularly implicated.[2] The part played by the nervous system in these disturbances assumed more importance following the work of such people as Ricker in Germany, and Speransky in Russia. But it was Reilly and his collaborators who supplied most details in this connection, and who definitely showed the importance of the irritation of visceral nerves.

The experimental facts revealed by the Reilly school have been confirmed subsequently by so many authors that there is no longer any point in confirming them, as Professor Samson Wright suggests. Any research-worker can easily reproduce them in any laboratory. It would certainly be useful, as Dr. Hopkin suggests, to study in Anglo-Saxon countries these phenomena whose recognition represents in our eyes one of the most important discoveries of biology and medicine in the past thirty years, but which still remain very mysterious from several points of view. One can only quote in this respect the works of Selye. The "reaction of alarm," subsequently described by Selye, is in fact the same as the phenomena described earlier by French workers. But his pathogenic concept is directly connected with the old suprarenal theory held in France at the beginning of this century.[3] The insufficiency of this theory now seems to us to have been well established and I have indicated elsewhere, on the basis of precise and confirmed experimental facts, that the "general syndrome of adaption" does not exist.[3]

Professor Samson Wright is justified when he says that the experimental facts revealed by Reilly and his collaborators are unexpected to a physiologist. I have already insisted on the importance of this fact and I must emphasise that I proposed the expression "*phenomena* of Reilly" because in my opinion there are two separate groups of fundamentally different phenomena, which it has for long been difficult to differentiate since they often appear to be confused:

(*a*) Adaptive reactions, normal and pathological, which are in the category studied by traditional physiology.

(*b*) Cellular disturbances, more or less prolonged and whose histological and clinical sequelæ may only appear after a very long latent period. These may escape the laws of classic physiology and that is why I have distinguished them by the name "neuxenic phenomena" from phenomena responding to the classic laws from which they have not yet been isolated. They often appear a long time after the aggression which caused them and they can be noticed normally only when the laboratory animals are observed for a long period and are operated on under very stringent aseptic conditions (especially as they habitually show a fall in general immunity). Neither of these conditions is generally observed in the common run of physiological research. Furthermore, neuxenic phenomena respond to special biological laws, in which the laws of probability play a notable part, having an importance

1. Decourt, P. Phénomènes de Reilly et syndrome général d'adaptation de Selye. Paris, 1951.
2. Decourt, P. *Pr. méd.* 1952, **60**, 663.
3. Decourt, P. *Ibid*, p. 1028.

comparable with the quantitative laws which represent one of the most important discoveries of the atomic physicists.

It is these neuxenic phenomena—which comprise only a part of the phenomena of Reilly, but which play an important rôle in pathology—that have truly baffled on the one hand all attempts at an explanation of the phenomena of Reilly in terms of conventional physiological thought,[4] and on the other hand the numerous efforts made over the last twenty years to prevent them.

The researches of the school of Reilly have above all been devoted to works of "pure science"; but they have nevertheless had happy consequences in applied science. In effect, it was the studies on the pathogenesis of the phenomena of Reilly and the efforts to prevent them which, beginning in 1935, led to the discovery of anti-histamine therapy in 1941 and to "narcobiotic" therapy in 1951. The results obtained were indeed negative with the anti-histamines and that is why, when I published the first results of anti-histamine therapy in man in 1942, I did not speak on that occasion of phenomena of Reilly which had been the starting-point of our research.[5] Reilly has himself emphasised that it was in 1952, after seventeen years' research, that it was at last possible to exert an effect on the phenomena, thanks to chlorpromazine. But these results are still very inadequate. I fear indeed that from their very nature no therapeutic procedures can ever completely prevent the neuxenic phenomena which represent the most serious disorder of the phenomena of Reilly. We can however hope to improve the methods of preventing them.

Paris. PHILIPPE DECOURT.

CHLORPROMAZINE AND EPILEPSY

SIR,—The occurrence of convulsions during treatment with chlorpromazine has been reported recently in two papers in your columns.[6 7]

A few months ago, a seizure was observed in an epileptic patient attending an outpatient clinic of this hospital who had been free from fits for 2 years and had been given chlorpromazine by mouth for a few weeks. The convulsion occurred during photic stimulation in the course of a routine E.E.G. examination. This observation suggested an investigation into the effect of chlorpromazine on the E.E.G. of epileptics.

So far fourteen epileptic patients have been examined. After a routine E.E.G., including overbreathing and photic stimulation, an intravenous injection of chlorpromazine is given (1 ml. [25 mg.] diluted to 10 ml. with normal saline). The amounts vary from 7 mg. for a child to 25 mg. for an adult. The injection is given slowly, 1–2 ml. (2·5–5 mg.) every 1–2 minutes.

In seven cases no specific changes have been seen. These patients had never shown grossly abnormal inter-seizure recordings. In the other seven cases the previously observed abnormal features increased but no new abnormal phenomena were seen. Thus in a child of 10, with clinical petit mal and typical 3 c/s spike-and-wave attacks, the attacks increased in duration from 2–3 to 25–110 seconds; in a woman of 35, generalised symmetrical multiple spike and slow wave bursts increased from one every 5–10 minutes to one every 5–30 seconds; in a man of 61 bilaterally synchronous and symmetrical 2–3 c/s slow-wave runs increased from one every 15–60 seconds to one every 5–10 seconds; in a man of 68 with left-sided anterior temporal focal spikes the increase was from 1 spike every 5–10 seconds to one every 2–3 seconds.

In each group of seven, one patient was without anticonvulsants, and the other six were on their usual medication.

The effect of chlorpromazine becomes noticeable within about 15 minutes. It appears to run roughly parallel with the increasing drowsiness.

The findings suggest that chlorpromazine by the intravenous route can increase the abnormal "epileptic" activity of the brain as seen in the E.E.G. They suggest that caution may be advisable in treating epileptic patients with the drug.

A detailed report of the investigations, with special regard to the use of chlorpromazine as a stimulating agent in E.E.G. work, will be published elsewhere.

Mapperley Hospital, Nottingham. WALTER FABISCH.

HEROIN

SIR,—Your editorial statement after Mr. Southwood's letter of June 11 suggests that unless the manufacture of heroin is prohibited in this country the success of efforts to deal with addiction elsewhere would be prejudiced. Such a ban can help to control addiction only if heroin legitimately made in Britain is getting illicitly into the hands of addicts. No evidence that this is happening has been, nor is it likely to be, produced. Surely the medical profession are justified in demanding such evidence before accepting the limitation of liberty involved by the ban, especially since Dr. Wand, in your report of his defence of the Government's action, admits that it may lead to an increase in suffering, however slight that may be.

In the United Nations publication, *Bulletin on Narcotics*, and in other United Nations documents, evidence may be found which leads to the conclusion that legally manufactured heroin supplies a negligible amount of the world's illicit traffic and that British sources supply none whatever. Some other relevant facts and conclusions from the same sources are these:

(1) The clandestine manufacture of heroin from opium and crude morphine is "child's play" and such manufacture is an important source of illicit heroin.

(2) As long as opium and morphine are available illicitly, it will be impossible to control heroin production and addiction.

(3) The U.S.A. has recently suffered a serious exacerbation of heroin addiction, affecting even school-children, despite a ban on heroin now of thirty years' standing. The suggestion that results will appear only when the heroin ban is universal cannot be maintained in the light of the known facts on the sources of illicit heroin.

(4) That the only way to abolish heroin addiction is to remove weaknesses in the control systems of opium-producing countries which are at the root of the trouble.

The main events leading to the present action may be summarised as follows:

In 1924 a committee of the House of Representatives of the U.S.A. met to consider the heroin problem, which was very serious then and since. It was concluded that the medical use of heroin was negligible compared with its evil effects, and the drug was banned. Since then international organisations have repeatedly toyed with the idea of a universal ban.

At the 1931 Conference for the Limitation of the Manufacture of Narcotic Drugs at Geneva, proposals to ban heroin entirely and to ban its export from producing countries were made. The British delegate opposed both measures.

In 1954 at the 243rd meeting of the Commission on Narcotic Drugs a vote was taken on a proposal that all countries should be recommended to ban heroin. The British delegate "abstained because he had received no specific instructions; he was confident, however, that the United Kingdom would give the resolution favourable consideration." This has now been done, but still the medical profession has been given no evidence that the ban will help the international problem.

It might be suggested that we should support the United Nations and set a good example in this respect, but it surely cannot be argued that to impose a useless prohibition which infringes medical liberty and may cause suffering would favourably impress anybody.

The second part of the Government ban, that on export, will be beneficial in lessening opportunity for theft in transit, and, since heroin can be made so easily, legitimate consumers overseas will not be deprived.

4. Tardieu, G., Tardieu, C. Le système nerveux végétatif. Paris, 1948.
5. Decourt, P. *Pr. Méd.* 1954, **62**, 541.
6. Vaughan, G. F., Leiberman, D. M., Cook, L. C. *Lancet*, May 28, 1955, p. 1083.
7. Lomas, J., Boardman, R. H., Markowe, M. *Ibid*, June 4, 1955, p. 1144.

I suggest, Sir, that we should not, in fact, "prejudice the success" of the international effort to prevent heroin addiction "if we dissociate ourselves from it," and that "a few sufferers should be allowed a little extra suffering" (as Dr. Wand suggests) only when evidence is produced showing that their suffering will lead to a greater good. Until then it is to be hoped that the medical profession will continue to oppose this administrative ban.

Loss of heroin in this country will be loss to patients not loss to addicts.

University College Hospital Medical School, London, W.C.1. D. R. LAURENCE.

*** There is a further reference to this subject in our parliamentary columns on p. 1271.—ED. L.

LUNG CANCER AND SMOKING

SIR,—Mr. Gould's comments (June 4) upon a relatively unimportant statistical test of significance that we used in our paper of three years ago should not be allowed to obscure the accumulated evidence upon the association between smoking and lung cancer. Since 1950 there have been published the results of thirteen other similar inquiries, carried out in six countries; all but one of them have revealed a substantial excess of smokers among the patients with lung cancer compared with the control group, and all of them have shown a large excess of heavier smokers amongst the lung-cancer patients. The evidence from these numerous retrospective inquiries has been well supported by the preliminary results of two prospective inquiries. In short, whether or not one interprets the weight of evidence as denoting causation, it is impossible, in our view, to suggest that the association is not firmly established.

In fact, the statistical argument employed by Mr. Gould is incorrect. The figures, the significance of which he questions, are:

	No. of men with lung cancer	*No. of men without lung cancer*
No. of smokers	1350	1296
No. of non-smokers ..	7	61

He argues that if N is the number of men from whom the lung-cancer patients are drawn, p_1 is the proportion who smoke, and p_2 is the proportion who have lung cancer, then the expected number of lung-cancer patients who smoke will be Np_1p_2 and the range within which the observed number is likely to lie will be $Np_1p_2 \pm \sqrt{Np_1p_2}$. With the figures he assumes for N, p_1, and p_2 (90,467, 0·975 and 0·015 respectively), he deduces that the expected number of smokers with lung cancer would be $1323 \pm \sqrt{1323}$—i.e., would lie between 1287 and 1359. The error lies in his choice of formula for the standard deviation of a proportion. The formula $\sqrt{Np_1p_2}$ is a valid approximation to the standard error of the number of lung-cancer patients who smoke, in an *unrestricted* random sample of N males (the approximation being valid because p_1p_2 is small). But we are concerned with the number of smokers found in a sample of 1357 lung-cancer patients, and this has a standard error of $\sqrt{1357p_1(1-p_1)}$. This would agree with the previous formula if p_1 were small, since $1357=Np_2$, but in fact p_1 is estimated as 0·975. The appropriate estimate of the range is, therefore, $1323 \pm \sqrt{(1357)(0·975)(0·025)}$. The observed number should, then, lie between 1317 and 1329 (though we would prefer to take limits of twice the standard deviation on either side of the expected number, giving 1311 and 1335).

The error would have become clear if Mr. Gould had applied his formula to estimate the expected limits for the number of *non-smokers* which might be observed by chance among the lung-cancer cases. He would then have found that the small number of non-smokers was statistically highly significant. A formula which gives different results when applied in two different ways to the same set of figures might reasonably be considered a trifle unconvincing.

London School of Hygiene and Tropical Medicine, W.C.1. RICHARD DOLL
A. BRADFORD HILL.

INVESTIGATION OF TONSILLECTOMY

SIR,—Your issue of June 4 (p. 1184) referred to a proposed experiment approved by the South East Metropolitan Regional Hospital Board. The same wording of this proposal has found its way into the local press: "At Farnborough Hospital, Kent, and perhaps other hospitals in that area, 1000 children on the tonsils waiting-list will be chosen for the trial: 500 will have their tonsils removed and 500 will not. The health of the two groups in the succeeding year will then be compared."

Farnborough Hospital is only one of several hospitals covered by the Bromley Group Hospital Management Committee, and the expression "in that area" leads both medical and lay public to assume that the consultant staff of these other hospitals may have agreed to such a plan, and, further, that this experiment would inevitably delay the admission of the 500 children in the control group, unless the waiting-list were more than twelve months.

The consultant staff of the Children's Hospital, Sydenham, would be glad if, through your columns, it could be made clear to practitioners in the area that no such inquiry is contemplated at this hospital, nor has the matter ever been referred to the medical staff committee, or to any individual member. Since ethical considerations have been raised in the national press in connection with this proposed inquiry, it seems to us advisable to have the matter clarified in this way.

Children's Hospital, Sydenham, London, S.E.26. D. F. ELLISON NASH
Senior Surgeon.

*** Mr. Ellison Nash's letter was shown to Dr. Duncan Leys, whose name was quoted as being in charge of the investigation, and he replied:

"Ethical considerations in this study differ in no way from those of other therapeutic trials. If the value of the operation, which has a definite but undetermined morbidity, were unquestionable, there would be no need to undertake an investigation."—ED. L.

TUBERCULOSIS IN EIRE

SIR,—In your issue of June 11 (p. 1221) you quote from an extremely interesting review of tuberculosis in Eire from 1949 to 1953. The figures show a very considerable increase in the number of patients treated, coupled with figures which show a very great fall in number of deaths.

If the death-rate can be reduced to zero or nearly so, is it safe to say that tuberculosis has been eliminated from Eire? Surely with the figures being what they are in Eire, England, and Scotland, the measuring-rod for tuberculosis should be amended so that the true criterion for tuberculosis is *not* the death-rate but the number of sick individuals.

High Wycombe, Bucks. L. PITCHER.

FOOD IN MENTAL HOSPITALS

SIR,—The mental hospitals have good reason to be grateful to the King Edward's Hospital Fund, and, as a member of a hospital management committee, I would like to congratulate the secretary of the Fund's hospital catering and diet committee on his article which you published last week.

It is very true that large sums must be spent on equipment, and staff, before a civilised standard of catering can be reached in mental hospitals. It is also true that an improvement well worth having can be made by spending even a few shillings per head more on food. As little as 2*s*. per head per week, spent on things that do not need cooking, such as milk, butter, cheese, fruit, salad, and marmalade, can make a very great difference.

Even this modest sum involves an extra expenditure of £5200 a year on 1000 patients, and H.M.C. members are timid about overspending.

If the publicity you are giving to the disgracefully low standards that exist at the moment, induces the timid to feed the patients, and damn the consequences, I feel sure that the Treasury pig will be induced to jump over the stile.

London, S.W.3. E. L. M. PULVERTAFT.

THE DIFFICULT APPENDIX

SIR,—I am grateful to Dr. Horwitz (May 14) for drawing my attention to Dr. Charles McBurney's original article,[1] which has recently been made available to me through the courtesy of the librarian of the Royal Society of Medicine.

In 1940, Sir Hugh Devine [2] mentioned a position of the appendix in which it extends under the terminal part of the ileum and may give rise to "umbilical pain and other atypical symptoms." He went on: "anomalous forms of acute appendicitis, too, are most difficult to diagnose in their early stages, and are the cause of many failures to make a prompt diagnosis." In abdominal diagnosis he reiterated the importance of a deep tender spot of visceral tenderness in localised inflammation, which is elicited by pressure of the finger point.

In 1937, Bowen [3] recommended palpating the iliac fossæ by trying to dip deep down on to the posterior abdominal wall with the fingers bent on the hand. He found that the local right-sided pain usually at or about McBurney's point. "In rare cases local tenderness and resistance are entirely absent anteriorly, in the lumbar region and on pelvic examination. In one case of which I have notes, the appendix was in a fossa behind the mesentery, where it was securely hidden from prying hands."

In 1928, Sir Zachary Cope [4] warned against temporising and recommended always to make a very thorough attempt to elucidate the problem when the patient is seen for the first time. "It is only by thorough examination that one can propound a diagnosis, and if the early stages of the disease are to be recognised note must be taken of the earliest symptoms."

He recorded that if the appendix be situated behind the cæcum, or behind the end of the ileum and common mesentery, the inflammatory process will be somewhat masked by the gut lying in front. "The place where deep tenderness can almost always be elicited is the spot just below the middle of a line joining the anterior superior iliac spine and the umbilicus. This roughly corresponds with the base of the appendix. Tenderness over McBurney's spot is not so constant. This tenderness appears to be localised actually in the appendix itself, for the site of the pain varies somewhat according to the position of the appendix."

In 1889, Dr. McBurney published 8 cases illustrating the new and successful treatment of early removal of the inflamed appendix. "All will acknowledge that every case of appendicitis may, so far as the cleverest observer can tell, have to pass many very dangerous obstacles before reaching the smooth water of a comfortable abscess. For my part, I would endeavour to ensure safety early, before reaching the rapids, rather than trust to finding my way blindfolded through a dangerous passage." His case 7 was tethered retro-mesenteric followed by temporary ileus.

He indicated the site of the greatest pain, determined by the pressure of one finger, as between $1^1/_2$ in. and 2 in. from the anterior spinous process of the ilium towards the umbilicus. "No one will dispute that if we could so improve our methods of diagnosis that we could recognize within the first few hours the serious nature of many cases, we would operate in these cases at once, willingly preferring to incur the risks of an operation rather than face the certainty of death from septic peritonitis. How may we improve our methods of diagnosis? At present I see no clearer road than the exploratory incision permitting a direct inspection of the parts and a complete study of the disease."

No reference was made to the literature in my article of April 9, which recorded local experience of early acute appendicitis in its various forms and physiological manifestations, with appropriate deep tender spots. These are grouped in the form of a square, each $1^1/_2$ in. from Zachary Cope's spot, which is just below the middle of a line joining the anterior superior iliac spine and the umbilicus. The lower right-hand corner of the square is the site of appendix abscess, but this is a complication and was not included. The picture is completed by various outlying spots which are described.

The chronological analysis of the symptoms and signs of the 7 cases illustrating the stages of inflammation of the tethered retro-mesenteric appendix revealed the constancy of the subileal deep tender spot and of the vertical line above this spot which is halfway between Zachary Cope's spot and the umbilicus. Deep tender spots indicating subileal spread of peritonitis are also indicated. Congenital retro-mesenteric tethering appears to account for the successive occurrence of severe appendicitis with ileus in several members of one family.

"The seat of the greatest pain determined by the pressure of one finger" must remain a cardinal point in diagnosis.

Hastings. J. A. KERR.

1. McBurney, C. *N. Y. med. J.* 1889, **50**, 676.
2. Devine, C. The Surgery of the Alimentary Tract. Bristol, 1940.
3. Bowen, W. H. Appendicitis, a Clinical Study. Cambridge, 1937.
4. Cope, Z. The Early Diagnosis of the Acute Abdomen. London, 1928.

Obituary

REGINALD LANGDON LANGDON-DOWN
M.A., M.B. Camb.

AMONG medical families and traditions the Langdon-Downs of Normansfield hold an honoured place. For three generations they have been responsible for this home for mentally defective children, and, as its medical superintendent for some forty years, Reginald Langdon-Down, the senior representative of the second generation, made a considerable contribution to the scientific understanding and humane treatment of mental defect.

His father, J. L. H. Langdon-Down, F.R.C.P., came up from Devonshire to study medicine at the London Hospital, where he eventually joined the staff. In 1868, with the help of his wife, he founded Normansfield as a home where mental defectives would be treated as members of a family. He allocated each small group of patients to the care of a single nurse, who slept in their room. This system was successfully continued at Normansfield until recently. From small beginnings the home grew till it was able to accommodate 200 patients, and with it grew its founder's reputation. He was the first to recognise and name mongolism, which is known in Russia as "Langdon-Down's disease."

Reginald was born in 1866, and from Harrow he went to Trinity College, Cambridge, where he took a first class in the natural sciences tripos in 1888. He continued his medical studies at the London Hospital, qualifying in 1892. After serving as an assistant demonstrator of anatomy and a house-physician at the London he took the M.R.C.P. in 1894, and settled in private practice in Teddington. He was already drawn to the family specialty, and two years later, on the death of his father, he and his brother Percival took over Normansfield. He continued the tradition of a family relationship with the patients, in which the staff share. Later, when Normansfield became a limited company, he insisted on resigning his M.R.C.P., though to the regret of his colleagues. Today the home is part of the National Health Service,

but the family tradition continues and the superintendent is a nephew, Dr. Norman Langdon-Down.

Langdon-Down was a man of lucid and analytical mind with corresponding powers of expression. He confined his considerable abilities within a limited field, and did all that he did well and graciously. Many of his outside interests were closely linked with his specialty. He was drawn into the inner counsels of the British Medical Association as an adviser on the evidence to be submitted to the Royal Commission on Lunacy Law and Mental Disorder, and he presided over a committee set up to study psycho-analysis, and served on the Central Ethical Committee. His services were recognised by election as a vice-president of the association. For many years he was physician to the National Association for the Welfare of the Feeble-minded, and by his work as chairman of the governors of Hampton Grammar School and as a governor of Epsom College he showed that he understood the needs of normal as well as defective children. He was an acknowledged expert on Oriental porcelain, pottery, and furniture, and was himself a keen painter in water-colours.

Dr. Langdon-Down's first wife died in 1917. Five years later he married again, and his second wife died in 1942. He leaves two sons and two daughters. He died on May 29 at the home which he shared with his daughter and son-in-law, Sir Russell Brain.

JOHN EVERIDGE

O.B.E., F.R.C.S.

Mr. John Everidge, consulting urological surgeon to King's College Hospital, died at his home in London on June 8.

From King's College School he went to study medicine at King's College Hospital, qualifying in 1908. When he gained his F.R.C.S. in 1912, he was the youngest fellow. He held resident appointments and the Sambrooke surgical registrarship at King's before he joined the R.A.M.C. in 1914. During the war he served with distinction as a surgical specialist, with the rank of major, and was mentioned in despatches and appointed O.B.E. Soon after demobilisation, in 1919, he was appointed to the honorary staff of King's College Hospital as assistant urologist.

On the retirement of Sir John Thomson-Walker in 1929, he was appointed senior urologist and gave up general surgery, which was at that time linked with the junior urological appointment; but he did not give up his interest in general surgery.

He was consulting urologist to Queen Alexandra Hospital, Millbank, and he worked at many smaller hospitals, including the Sutton and Cheam Hospital and the Carshalton War Memorial Hospital. He was one of the original consultants appointed to London County Council hospitals. In the late war he was one of the senior staff at the Horton Emergency Hospital.

Mr. Everidge was long a prominent member of the urological section of the Royal Society of Medicine and he served as president during the early part of the late war. He was a founder member of the British Association of Urological Surgeons, of which he later became hon. treasurer, but his slight deafness made him refuse the presidency.

J. G. Y-B. writes: "At King's Everidge's splendid teaching, imparted with wit without crudity, attracted large throngs to his clinics. In surgery he was a pioneer in transurethral prostatic surgery as long ago as 1927, and played a part in the development of the modern resectoscope. Always helpful to his juniors, it was a matter of pride to him that so many of his old house-surgeons held consultant posts. His charm was outstanding and he was held in the highest esteem by his colleagues and friends; patients were devoted to him by virtue of his sympathy.

"Outside his work he had many interests—lawn tennis in his early days, and in more recent years golf at Epsom and Deal, while many weekends were spent fishing with urologist friends. He was a member of the Flyfishers' Club. He always remained young, in surgery by keeping up to date with new procedures, and in private life by his enjoyment of all student activities, dances, and fast cars. His after-dinner speeches were polished and entertaining. He will be greatly missed as a surgeon and as a friend."

His wife was formerly Miss Kathleen Robertson, and he leaves a son and a daughter.

ROBERT ARTHUR LYSTER

M.D. Birm., B.Sc. Lond. & Birm.

DURING the first quarter of this century Robert Lyster's name was prominent among the planners of the personal health services, particularly the school medical service, and his colleagues, especially those of the older generation, will learn with regret of his death at the age of 82 at his home in Bournemouth.

He began his studies at Mason College, Birmingham, taking the B.SC. Lond. with double honours in 1893. He went on to study medicine at Queen's College and at Birmingham University, qualifying in 1900. He was early drawn to preventive medicine, and he held various lectureships in hygiene in Birmingham, including one at the Birmingham and Midland Institute. Meanwhile he took the D.P.H. in 1901, the B.SC. in public health of Birmingham University in 1905, and the M.D. in 1908. He had already entered the public-health service and he obtained varied experience while holding appointments with varied authorities, including those of the West Riding of Yorkshire, Sutton Coldfield, Warwickshire, and Handsworth.

In 1908 he was appointed county M.O.H. for Hampshire, and during the next twenty-one years his work was centred on, but not confined to, Hampshire. In his own area he set up sanatoria, an institution for mental defectives, and child-welfare centres, and over the years he also became a member of the medical board of the Lord Mayor Treloar's Hospital at Alton, of the faculty of medicine and board of studies in hygiene of the University of London, and of the Central Midwives' Board, a president of the Society of Medical Officers of Health, and editor of *Public Health*. H. C. M. W., who has helped us in these recollections, recalls that Lyster's dynamic personality and strong convictions often made him appear intolerant of other people's opinions, but adds that "many of his colleagues and assistants will look back with gratitude to the guidance and help that they received from him while he held office in the public-health service."

In 1929 Dr. Lyster retired, rather earlier than is usual, for he hoped to go into politics. He stood as a Labour candidate in the parliamentary elections of 1929 and 1935, but he was unsuccessful. He had, however, been elected to the Bournemouth borough council and he later concentrated on local government, serving for many years as a valued and knowledgeable member of the council's health committee.

EDWARD CECIL CLEMENTS

C.B.E., M.R.C.S.

Group-Captain Clements, formerly consultant in ophthalmology to the Royal Air Force, died on May 19 at the age of 81.

He qualified from the Middlesex Hospital in 1901, and after a period of study under the elder Lang at Moorfields he went into private ophthalmic practice at Lincoln.

As a Territorial officer he was called up as soon as war broke out in 1914, and it was during his service with the R.A.M.C. that he observed that people in certain occupations, such as bank clerks and those using precision instruments, tended to lose their power to maintain binocular single vision and to become affected by eye-strain, which could not, as a rule, be compensated by correcting spectacles. Appreciating that this was really an imbalance of binocular vision, or heterophoria, he instituted eye exercises and found that these improved or reduced the eye-strain. After he was transferred to the Royal Flying Corps, and later to the Royal Air Force as an ophthalmologist, he noticed the same condition in pilots and realised its importance in judging distance when landing aircraft.

He used the Maddox rod for diagnosis and Black's amblyoscope in treatment, and in 1918 he formed his school of heterophoria at the aviation candidates' medical board in London. By this contribution to the growing study of orthoptics he undoubtedly reduced the wastage of pilots, both trained and undergoing training.

In 1919 Clements was appointed to a permanent commission in the medical branch of the Royal Air Force as a squadron-leader. A year later he was promoted to wing-commander and in 1928 to group-captain. He continued to practise as an ophthalmic specialist throughout his service and he was appointed consultant in ophthalmology in 1931. A colleague who worked with Clements at Holly Hill, Hampstead, in the 20's recalls with awe his untidiness and with affection his kindness and generosity. He was created C.B.E. in 1934 and retired later in that year.

In recent years the approach to heterophoria has changed, but there can be no doubt as to the value of the work Clements did in the early days of aviation ophthalmology.

The photograph of Dr. C. W. Buckley which we published last week was by Navana Vandyk, London.

Diary of the Week

JUNE 19 TO 25

Monday, 20th

POSTGRADUATE MEDICAL SCHOOL OF LONDON, Ducane Road, London, W.12
4 P.M. Dr. Lewis Dexter (Boston): Cor Pulmonale.

Tuesday, 21st

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.1
5 P.M. Dr. Kenneth Perry: Pulmonary Disease Associated with Metallic Oxide. (Ernestine Henry lecture.)
INSTITUTE OF DERMATOLOGY, St. John's Hospital, Lisle Street, W.C.2
5.30 P.M. Dr. O. L. S. Scott: Hypostatic Ulcers.

Wednesday, 22nd

INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. R. W. Riddell: Subcutaneous Mycotic Infections.

Thursday, 23rd

POSTGRADUATE MEDICAL SCHOOL OF LONDON
4 P.M. Dr. J. C. Gilson: Rheumatism and Lung Disease.
INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. Henry Haber: Reticuloses.

Friday, 24th

POSTGRADUATE MEDICAL SCHOOL OF LONDON
2 P.M. Mr. John Bruce: Regional Enteritis.
4 P.M. Mr. P. McG. Moffatt: Use of the Ophthalmoscope in Medicine. (Second of two lectures.)
ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
8.15 P.M. *Obstetrics and Gynæcology.* Mr. A. L. T. Easton, Dr. Peter Andrews, Mr. Stanley Way, Mr. Anthony Charles: Carcinoma of the Vulva.

Saturday, 25th

RADCLIFFE INFIRMARY, Oxford
9.15 A.M. Dr. Neville Oswald: Chronic Bronchitis.

Appointments

CONNELL, H. C., M.R.C.S., D.P.M.: deputy medical superintendent, Rampton Hospital, Retford, Notts.
FERGUSON, R. S., M.B. Glasg., D.P.M.: whole-time asst. psychiatrist (S.H.M.O.), St. Nicholas' Hospital, Gosforth, Newcastle upon Tyne.
FLEMINGER, J. J., M.D. Camb., M.R.C.P., D.P.M.: asst. physician, department of psychological medicine, Guy's Hospital, London.
GILMOUR, I. E. W., M.B. Edin., F.R.C.S.E.: surgeon, Leith Hospital, Edinburgh.
GOODCHILD, JOYCE C., M.B. Lond.: asst. geriatrician (S.H.M.O.), Northampton and Kettering H.M.C.S.
LEVY, JACK, M.B. Glasg., D.O.M.S.: whole-time ophthalmologist, Royal Infirmary, Edinburgh.
MORROW, W. F. K., M.B. Belf., D.A.: part-time anæsthetist (S.H.M.O.), Banbridge and Dromore and South Down H.M.C.S.
* NIKITIK, CONSTANTIN, M.B. Lwow, D.A.: consultant anæsthetist, South Shields H.M.C.
OLDHAM, K. W., M.R.C.S., D.A.: asst. anæsthetist (S.H.M.O.), High Wycombe and district H.M.C.
PEARCE, R. D., M.R.C.S., D.P.H.: deputy M.O.H., deputy principal school M.O., and deputy port M.O., Ipswich.
ROEMMELE, P. M., M.B. Edin., F.R.C.S.E., consultant surgeon, North West H.M.C., Northern Ireland Hospitals Authority.
SCOTT, L. B., M.B. Lond., F.R.C.S.E., whole-time asst. consultant plastic surgeon, Whiston Hospital, Alder Hey Children's Hospital, and the Royal Southern Hospital.
SEYMOUR, FRANCIS, M.B. Lpool, asst. M.O., and deputy M.O., borough of Buckingham, Bletchley, Linslade, and Newport Pagnell urban districts, and Buckingham, Newport, Pagnell, and Wing rural districts.
VINCENT, N. A., M.B. Sheff., D.A.; whole-time anæsthetist, Moorgate General Hospital, Rotherham, Yorks.
WILSON, L. A., M.D. Aberd., M.R.C.P.: consultant physician (geriatrics) based on Glenburn Wing, Woodend Hospital, Aberdeen.

* Amended notice.

Notes and News

MENTAL NURSING FILMED AGAIN

THOSE who saw *The Troubled Mind* [1] need not fear that *Light through the Clouds*—a film about nursing at The Retreat, York—will take them over the same ground; for though the two films have the same main theme (that of a young girl entering mental nursing), and both are skilfully photographed and well scripted, they are complementary rather than overlapping. In the first, emphasis is often on patients and their symptoms; in the second it is on methods of treatment. Neither perhaps gives a complete picture of mental nursing (if such a thing is possible) but together they come very close to doing it.

The Retreat is an exceptional hospital, with one of the longest traditions, in this country, of humane care of the mentally ill; and *Light through the Clouds* conveys well the atmosphere of friendship and coöperation in which the work there is done. The rate of staffing is high—100 nurses to 270 patients—which may account for the unusually peaceful tempo at which things seemed to move. The early sequences show well that the nurse in a mental hospital learns all the techniques of sick nursing which would come her way in a general hospital—a fact not always appreciated by general nurses. Then follow examples of forms of treatment used specifically on mental patients—insulin coma, electro-convulsion therapy, and psychotherapy. The work of the physiotherapy and X-ray departments is also lightly sketched. Members of the nursing staff take the parts of patients, and certainly give no cause for alarm to young prospective nurses who may see the film. Some of the recreations of the nurses are shown, and the beauty of the setting of The Retreat, as well as the fine old house from which it has grown, are given their proper value. The commentary ends with a direct appeal to the young girls who might be interested—"the Janets and the Kathleens"—to consider mental nursing as a career.

The production and photography are by Mr. C. Harold Wood, and the film has been made under the direction of Mr. P. Thomas Oliver, and Mr. of Alan H. Pickard who also wrote the commentary.

A DOCTOR AND THE RAIL STRIKE

A DOCTOR in Birmingham has declined to see one of his patients, the wife of a railway striker, until the strike is over.[2] The patient had an appointment to see him privately, but after the strike began the doctor wrote to her husband:

"I am afraid my principles prevent me from seeing patients who are on strike except in cases of emergency. . . . If you will 'phone for an appointment when the strike is over, I will try to fix a convenient date."

The doctor is reported to have said that nothing in his refusal was detrimental to the patient. She was not ill now and the appointment was for a routine examination.

University of Oxford

Surgeon Rear-Admiral James Hamilton has been appointed director of postgraduate medical studies for five years from Oct. 1.

On June 4 the degree of D.M. was conferred in absence on R. W. Gilliatt.

University of Cambridge

On May 28 the following degrees were conferred:

M.B.—*William Atherton, A. E. L. de Thierry, *J. F. Walker

* By proxy.

University of Durham

Dr. Donald Court, reader in child health, has been appointed to the chair of child health in the Newcastle division of the university, in succession to the late Sir James Spence.

Dr. Court graduated in medicine at the University of Birmingham in 1936 and later became house-physician at Great Ormond Street Hospital and pædiatric registrar at Westminster Hospital. In 1938 he took the M.R.C.P. and the D.C.H. Before taking up his present appointment at Newcastle he held a Nuffield fellowship in child health. In 1947 he proceeded to his M.D. degree. He contributed the chapter on tuberculosis in *Garrod, Batten, and Thursfield's Diseases of Children* and he has also published papers on the health of nurses. He is a joint author of recent publications on infantile mortality in Newcastle.

1. *Lancet*, 1954, ii, 1291.
2. *Times*, June 11, 1955.

Royal College of Physicians of London

On Tuesday, July 12, at 5 P.M., at the college, Pall Mall East, S.W.1, Lord Amulree will give the F. E. Williams lecture, on Modern Hospital Treatment and the Pensioner.

Royal College of Surgeons of England

At a meeting of the council held on June 9, with Sir Harry Platt, the president, in the chair, Mrs. Mitchiner presented two badges of office for the vice-presidents, given in memory of her husband, Philip H. Mitchiner. The medical directors-general of the Army and the Royal Air Force presented the Mitchiner medal to Colonel W. R. M. Drew, late R.A.M.C., for his contributions to medicine in the Army, with special relation to the teaching of tropical medicine; and the Lady Cade medal to Squadron-Leader P. Howard for his experimental work in the development of partial-pressure suits and pressure-breathing equipment.

The following were coöpted to the council for the year 1955–56, representing various branches of practice:

Dr. O. C. Carter, general practice; Mr. A. B. Nutt, ophthalmology; Dr. E. Rohan Williams, radiology; Mr. Myles L. Formby, otolaryngology; Dr. Frankis T. Evans, anæsthetics. Prof. F. C. Wilkinson was invited to act as the representative of dental surgery.

The following examiners were appointed for the coming year:

Fellowship.—Ophthalmology: E. A. Blake Pritchard. Anatomy: Mary F. Lucas Keene, Lambert C. Rogers, R. J. Last, Sir Cecil Wakeley. Applied Physiology and Pathology: Geoffrey Hadfield, Albert Hemingway, J. L. D'Silva, H. A. Magnus.

Diploma of M.R.C.S., L.R.C.P.—Elementary Biology: Alan Fisk, G. E. H. Foxon. Anatomy: E. W. T. Morris, A. J. Heriot, W. J. Hamilton. Physiology: Esther M. Killick, B. D. Wyke. Midwifery: R. G. Maliphant, W. R. Winterton, H. H. Fouracre Barns, Ian Donald. Pathology: Joseph Bamforth, A. C. Cunliffe, Sir Cecil Wakeley, E. G. Tuckwell.

Diplomas of fellowship were granted to the following:

A. B. McGrigor, I. L. Gregory, * Peggy K. Orton, Cecilie Greig, D. A. Watson, R. W. Bottoms, Gordon Hadfield, G. S. Plaut, P. K. Pybus, John Humphreys, Alexander Gol, A. E. Richardson K. R. J. de Belder, J. E. H. Pendower, G. H. Jantet, Leon Friedmann, R. H. Baird,† J. C. B. Serjeant, N. E. Brand, E. V. Peipman, W. A. Baker, Mihir Kumar Guha Thakurta, F. J. Hedden, E. W. Parry, Madan Mohan Chawla, T. J. Thwaite, A. H. Toyne, Betsy Brown, G. P. Debenham, Hyman Gaylis, N. A. A. Myers, Sheroo Darabsha Broacha, H. H. Chesterfield-Evans, † C. I. Phillips, Bhabani Bhattacharyya, B. L. Cornish, Kevin Cronin, Jackie Jacob, M. L. H. Lee, H. G. Lowe, G. D. H. Shawe, Leslie Simon, N. V. Addison, T. J. Claffey, * C. N. d'E. Eastes, Frank Ellis, W. F. Gordon, Benjamin Ho, W. M. Keynes, J. P. Maddern, P. F. Mountford, J. K. Oyston, Harry Piggott, D. R. Richard, T. M. Robinson, W. G. Taylor, G. D. Tracy, H. T. G. Williams, G. S. M. Botha, * D. J. Brain, J. A. C. Brown, Ranes Chandra Chakravorty, D. A. Cooper, J. B. Doss, Mohamed Saad El-Din Ed-Dars, W. B. Fleming, P. A. Freeman, S. B. Joshi, R. H. Kernutt, J. A. Loeb, I. L. McVey, Satyendra Nath Basu Roy, C. G. Tulloh, R. G. Williams, K. P. Abel, Syed Mohamed Alwi Alhady, J. G. Corson, D. O. Cropley, J. A. Myburgh, Nergish Rustomji Patel, G. J. Schnitzler, S. R. Shar, W. W. Slack, V. H. Smith, A. B. Vivian, A. F. Wallace, D. W. Warren, D. G. Failes, J. F. H. Graff, Alan Jessup, Cyril Shaldon, D. D. Arnold, Jyotishchandra Narendrarai Joshipura.

* In otolaryngology. † In ophthalmology.

Diplomas of membership were granted to the following:

B. M. G. Clarke, A. Gibbons, Janet Goodall.

The following postgraduate diplomas were granted jointly with the Royal College of Physicians:

D.M.R.D.—N. H. Aldridge, L. J. du Preez, David Edwards, Shirley E. Entrican, W. C. Heron, Kazi Shamsul Huque, Catherine V. Krafft, Omar Bin Din, W. M. O. Purcell, Arun Rattarangsi, M. J. Ryan, M. M. Schechter, Jogendra Prasad Sinha, G. C. Stavrakis.

D.M.R.T.—H. D. Batt, P. E. Bodkin, T. B. Brewin, J. C. Courtney, Hazel E. Davidson, Hung Chiu Ho, Youssef Nasrallah, I. M. Shulman, A. J. Ward.

D.Path.—Leonard Bernstock, D. A. L. Bowen, Moses Levene, Leslie Michaels, N. E. Rankin, P. D. Roberts, T. P. Telfer, T. A. White.

Royal College of Physicians of Ireland

At a meeting of the college held on June 3, with Dr. Edward Freeman, the president, in the chair, the following were admitted to the fellowship:

P. B. B. Gatenby, S. D. McGrath, M. A. Majekodunmi, M. G. Nelson, H. O'Flanagan, P. P. O'Malley.

The following were admitted to the membership:

P. A. Farrelly, E. W. Knox, J. Lowry, D. H. Merrin, Eleanor T. Rolston.

Royal Australasian College of Physicians

On May 11 the following were admitted to the honorary fellowship of the college: Sir William Slim, the governor-general of Australia, the Rt. Hon. Robert Menzies, the prime minister, and Sir Russell Brain, F.R.C.P.

Royal Society of Medicine

At the 150th anniversary dinner of the society on June 7, the Duke of Edinburgh was made an honorary fellow and received a copy of the commemorative history of the society, written for the occasion by Dr. Maurice Davidson, who presented the volume. The President, Sir William Gilliatt, told the Duke that one of the privileges he would now enjoy would be to borrow eight volumes at any one time from the R.S.M. library, which, Sir William said, might fairly be called the National Medical Library of the Commonwealth, for, of the society's 10,000 fellows, nearly 2000 lived overseas. Like many similar institutions the R.S.M. was much troubled by the rising cost of books, bindings, and paper, but there were good hopes, the President went on, that the generosity of friends and the loyalty of fellows would enable them to place their finances in an impregnable position. Proposing The Society, the Duke recalled the time when, in its earlier days, Robert Liston's 30-second leg amputation was as much the talk of the day as the 4-minute mile was now. Turning to the modern scene, he said he was sure that the whole essence of medicine lay in the personal relationship between doctor and patient; and that was why he was particularly glad to be present at an occasion where Sir William presided—though, he hastened to add, he had never actually been a patient of his. In his response, Sir Francis Walshe, immediate past president of the society, spoke of the immense pride and pleasure of all the fellows in having the Duke with them, "in a double sense one of our number." The Guests, cordially proposed by Sir Arthur Porritt, drew sparkling replies from Lord Salisbury and Lord Adrian.

Medical Association for the Prevention of War

Prof. L. S. Penrose, F.R.S., will open a discussion on his book *The Objective Study of Crowd Behaviour* at 8 P.M. on Wednesday, June 22, at 45, Russell Square, London, W.C.1. Dr. Norman Glaister will be in the chair.

Oxford Graduates' Medical Club

The summer dinner of this club will be held in Oriel College, Oxford, on Friday, July 1, at 7 P.M., with Dr. F. G. Hobson in the chair. Members may bring medical men or women as guests. Tickets (35*s.*) may be had from Mr. Ronald Macbeth, F.R.C.S., department of otolaryngology, Radcliffe Infirmary, Oxford.

Hospitals' Symphony Orchestra

This orchestra is to give a concert at B.M.A. House, Tavistock Square, London, W.C.1, on Saturday, June 25, at 7.30 P.M. The programme will include Haydn's Trumpet Concerto, Brahms's Fourth Symphony, and works by Dvořák, Sibelius, and Berlioz. Tickets (10*s.*, 7*s.* 6*d.*, 5*s.*, and 3*s.* 6*d.*) can be had from Mr. Mitchell, the concert manager, St. Thomas's House, S.E.1.

United States Supreme Court

On June 6 the court found that Dr. John Peters, senior professor of medicine at Yale University, had been wrongfully dismissed as a "security risk" from his post as a government consultant in 1953. The court's majority opinion ordered the Civil Service Commission to strike from its records a finding by the old loyalty review board that there was a reasonable doubt as to Dr. Peters's loyalty.

Canadian Nuffield Fellows

Nuffield travelling fellowships in medicine have been awarded this year to the following Canadian doctors: Dr. H. R. Brodie, Dr. W. R. N. Lindsay, Dr. D. G. Marshall, and Dr. J. A. Palmer. A travel grant has been awarded to Prof. R. L. de C. H. Saunders, head of the department of anatomy, Dalhousie University, to study micro-radiographic equipment in England.

CORRIGENDA: *A Ruler for Use in Electro-encephalography and Electrocardiography.*—In this article (June 4, p. 1158) the third sentence in the third paragraph should read: "Should lines other than those immediately adjacent to the vertical be used, the figures representing C.P.S. and seconds are divided by 2 and 3 and multiplied by 2 and 3 respectively."

Pembury Hospital, Kent.—In recording (June 4, p. 1184) the dedication of a memorial window at this hospital, we gave the name of Mr. J. F. Carter Braine incorrectly.

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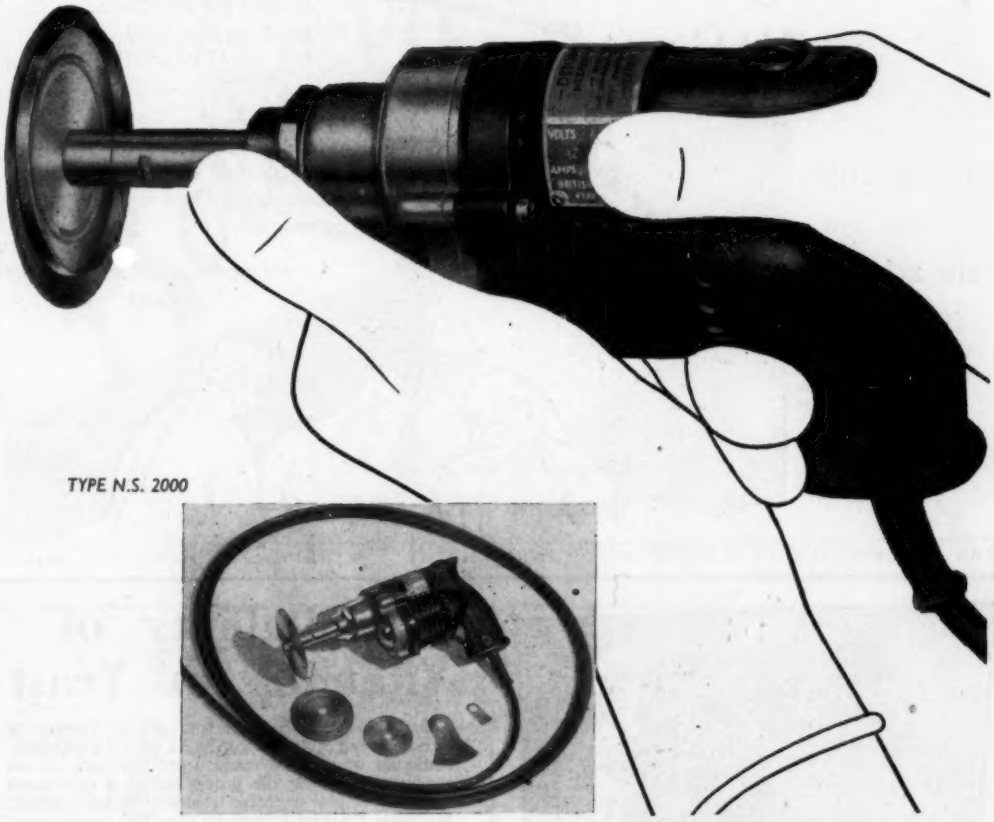

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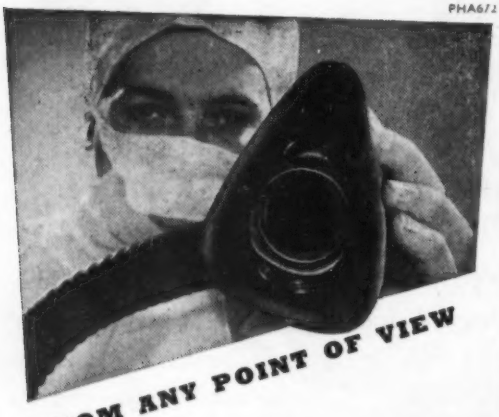

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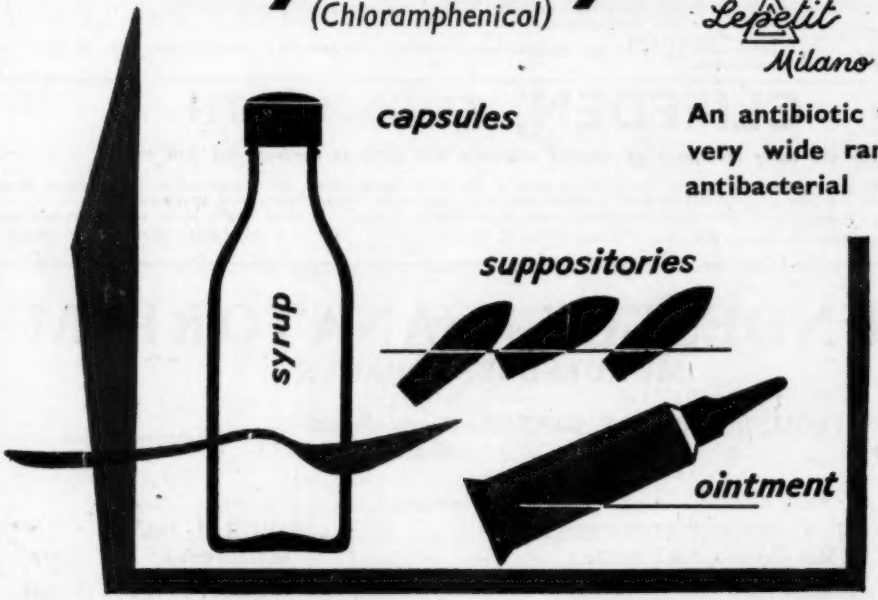

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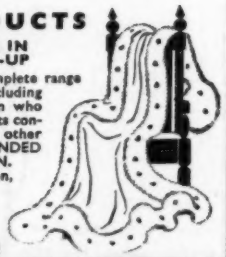

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Vacancies

ACADEMIC AND EDUCATIONAL SECTION *Page* 43

ANÆSTHETICS
London, E.1. Reg. 46
Royal Marsden, S.W.3. Reg. 46
South East Met. R.H.B. Reg. .. 47
St. Leonard's, N.1. Sr. H.O. 47
Bromley Group H.M.C. Sr. H.O. .. 48
Dudley, Stourbridge & Dist. Sr. H.O. 50
Edgware Gen. Sr. Reg. 50
Leamington Spa. Warneford Gen. H.O. 52
Leeds R.H.B. Regs. 52
Manchester. West Manchester H.M.C. Sr. H.O. 53
Mid-Glamorgan H.M.C. Sr. H.O. .. 53
Mid-Kent H.M.C. Sr. H.O. 53
Newcastle R.H.B. Locum Cons. or Sr. H.M.O. 44
Nottingham Gen. Sr. H.O. 53
Orpington, Kent. Sr. H.O. 54
Reading. Royal Berks. Sr. H.O. .. 54
Watford Hosps. Reg. 56
New Zealand. Waikato Hosp. Board. Jr. or Sr. Specialist. 45
Western Australia. Royal Perth. Asst. Director. 45

BACTERIOLOGY
Australia. Brisbane & South Coast Hosps. Board. Bacteriologist .. 45

BIOCHEMISTRY
Australia. Brisbane & South Coast Hosps. Board. Biochemist .. 45

CASUALTY
Wanstead, E.11. Sr. H.O. 47
Cardiff H.M.C. Sr. H.O. 49
Coventry & Warwickshire. Sr. H.O. 50
Douglas. Noble's Isle of Man. H.O. .. 50
Dudley, Stourbridge & Dist. Sr. H.O.'s 50
Hemel Hempstead. West Herts. Jr. H.M.O. 51
Hounslow Gen. Middx. Sr. H.O. .. 51
Ipswich. East Suffolk & Ipswich. Sr. H.O. 51
Leamington Spa. Warneford Gen. Sr. H.O. 52
Leeds R.H.B. H.O.'s 51
Luton & Dunstable. Sr. H.O. .. 52
Newcastle Gen. Jr. H.M.O. 53
Newport, I.W. St. Mary's. Sr. H.O. 53
Paisley & Dist. Hosps. B.O.M. Jr. H.M.O. 54
Plymouth. South Devon & East Cornwall. Sr. H.O. 54
Romford. Oldchurch. Sr. H.O. .. 54
Rugby. Hosp. of St. Cross. Jr. H.M.O. 54
Salisbury Gen. Locum Sr. H.O. .. 54
Salisbury Gen. Sr. H.O. 55
Slough. Upton. H.O. 55
South West Met. R.H.B. Sr. Casualty Officer 45
St. Albans City. Reg. & Locum Reg. 56
St. Helens & Dist. H.M.C. Sr. H.O. 56
Watford. Peace Mem. H.O. 56
Wigan. Royal Albert Edward Infy. Pre-reg. H.O. 56
Windsor. King Edward VII. Sr. H.O. 56
Wolverhampton Group. H.O. .. 57

CHEST AND TUBERCULOSIS
Highlands Gen., N.21. Sr. H.O. .. 46
Hosps. for Diseases of the Chest. P.-t. Cons. 44
Hosps. for Diseases of the Chest. P.-t. Sr. Reg. & H.O.'s .. 45/46
Braintree. Black Notley. Sr. H.O. 48
Cardiff H.M.C. Sr. H.O. 49
Cottingham, E. Yorks. Castle Hill San. & Raywell San. Sr. H.O. or Locum 49
East Anglian R.H.B. Sr. Reg. .. 50
Leeds R.H.B. Sr. H.M.O. 44
Manchester R.H.B. Reg. 52
South West Met. R.H.B. Sr. H.M.O. 45
West Fife Hosps. B.O.M. Reg. or Jr. H.M.O. 56

DENTAL SURGERY
Bristol. Hortham-Brentry H.M.C. P.-t. Dental Officers 48
South West Met. R.H.B. Cons. .. 44

DERMATOLOGY
Guy's, S.E.1. H.O. 45
St. John's Hosp. for Diseases of the Skin, W.C.2. Sr. Reg. 47
Birmingham Skin. Sr. H.O. or H.O. 48
Glasgow. Stobhill Gen. Pre-reg. H.O.'s 50

EAR, NOSE, AND THROAT
Metropolitan E.N. & T., W.8. H.O. .. 46
Royal National T.N.&E., W. H.O. 46
Royal Northern, N.7. Reg. 46
South East Met. R.H.B. Reg. .. 47
Birmingham & Midland Ear & Throat. H.O. 48
Bradford. Royal Eye & Ear. Sr. H.O. 48
Canterbury. Kent & Canterbury. Sr. H.O. 49
East Anglian R.H.B. Reg. 50
Nottingham Gen. Sr. H.O. 53
Shrewsbury. Eye, Ear & Throat. Sr. H.O. 55
Southampton. Royal South Hants & Southampton Gen. Sr. H.O. .. 55
South-Western R.H.B. & United Bristol Hosps. P.-t. Cons. .. 44
Wolverhampton Group. H.O. .. 57

GERIATRICS
Bradford A & B H.M.C. H.O. .. 48
Glasgow. Stobhill Gen. Pre-reg. H.O.'s 50

HÆMATOLOGY
Australia. Brisbane & South Coast Hosps. Board. Hæmatologist .. 45

INFECTIOUS DISEASES
Ipswich. St. Helen's. H.O. 51
Paisley & Dist. Hosps. B.O.M. H.O. .. 54

MEDICINE
Central Middlesex, N.W.10. H.O. & Pre-reg. H.O.'s 45
German, E.8. Pre-reg. H.O. 45
Guy's, S.E.1. Reg. 45
North East Met. R.H.B. Reg. .. 46
Princess Beatrice, S.W.5. H.O. .. 46
Royal London Homœopathic, W.C.1. H.O. 46
South London Hosp. for Women & Child., S.W.4. Sr. H.O. 47
St. Leonard's, N.1. H.O. 47
Westminster, S.W.1. Locum Sr. Reg. 47
Aberdeen Gen. Hosps. B.O.M. Jr. H.M.O. & Reg. 47
Ashton, Hyde & Glossop H.M.C. H.O. 47
Aylesbury. Stoke Mandeville. H.O. 47
Birmingham. Solihull. Pre-reg. H.O. 48
Bradford Royal Infy. Sr. H.O. .. 48
Bristol. Ham Green. H.O.'s. 48
Carlisle. Cumberland Infy. Sr. H.O. 49
Chelmsford. St. John's. Locum Reg. 49
Colchester H.M.C. H.O. 50
Crewe & Dist. Mem. Sr. H.O. .. 49
Dudley, Stourbridge & Dist. Sr. H.O. & Pre-reg. H.O. 50
Grantham & Kesteven Gen. Sr. H.O. or Pre-reg. H.O. 50
Grimsby Gen. Reg. 50
Hounslow, Middx. H.O. 51
Kingston, Surrey. Pre-reg. H.O. .. 51
Leeds R.H.B. H.O.'s 52
Lincoln. St. George's. Jr. H.M.O. .. 52
Liverpool. Rathbone. Sr. H.O. .. 52
Lowestoft & North Suffolk. H.O. or Sr. H.O. 52
Maidstone. West Kent Gen. Pre-reg. H.O. 52
Manchester. Withington. Sr. H.O. 53
Mid-Glamorgan H.M.C. Sr. H.O. & H.O.'s 53
Newmarket Gen. H.O. 53
Pontypridd & Rhondda H.M.C. Sr. H.O. 54
Poole Gen. Pre-reg. H.O. 54
Portsmouth Group H.M.C. Pre-reg. H.O. 54

(continued overleaf)

Ryde, I.W. Royal I.W. County. Pre-reg. H.O. 54
Scotland. South-Eastern R.H.B. Reg. 55
Sheffield. City Gen. H.O. 55
Sheffield R.H.B. Sr. Reg. 55
Southend-on-Sea. Gen. H.O. .. 55
Southport Gen. Infy. H.O. 56
Stafford. Staffordshire Gen. Infy. Pre-reg. H.O. 56
Stoke-on-Tren.. Haywood. Jr. H.M.O. 56
Swindon & Dist. H.M.C. H.O. .. 56
Warrington Infy. Pre-reg. H.O. or Sr. H.O. 56
Michigan, U.S.A. Oakwood. Residency 57

NEUROLOGY
National Hosps. for Nervous Diseases. P.-t. Cons. 44
Newcastle Gen. Sr. H.O. 53

NEUROSURGERY
Regional Neurosurgical Centre, S.E.18. Sr. H.O. 46
Bristol–Cossham/Frenchay H.M.C. Sr. H.O. 48

OBSTETRICS AND GYNÆCOLOGY
Hosp. of St. John & St. Elizabeth, N.W.8. H.O. 45
Memorial, S.E.18. H.O. 46
North East Met. R.H.B. Reg. .. 46
North Middlesex, N.18. H.O. & Pre-reg. H.O. 46
St. Stephen's, S.W.10. Reg. 47
Birmingham. Dudley Road. Sr. H.O. 48
Birmingham. Lordswood Maternity. H.O. 47
Birmingham. Sorrento Maternity. H.O. 47
Bolton Dist. Gen. H.O. 49
Bradford. St. Luke's. H.O. 48
Bury & Rossendale H.M.C. Sr. H.O. 49
Canterbury. Kent & Canterbury. H.O. 49
Cardiff H.M.C. Sr. H.O. 49
Glasgow. Stobhill Gen. Pre-reg. H.O.'s 50
Hull. Kingston Gen. Pre-reg. H.O. .. 50
Leeds R.H.B. Reg. & H.O.'s 51/52
Leicester Royal Infy. Locum Sr. H.O. 51
Luton & Dunstable. H.O. 52
Luton Maternity. H.O. 52
Manchester R.H.B. Regs. 52
Manchester United Hosps. Sr. H.O. 52
Newcastle upon Tyne H.M.C. & Hexham & Dist. H.M.C. Pre-reg. H.O.'s 53
Newmarket Gen. Sr. H.O. 53
Nottingham. Highbury. Sr. H.O. 53
Paisley & Dist. Hosps. B.O.M. H.O. 54
Paisley & Dist. Hosps. Maternity Unit. Locum Jr. H.M.O. 54
Plymouth. South Devon & East Cornwall Gen. H.O. 54
Poole Gen. Sr. H.O. 54
Portsmouth Group H.M.C. Sr. H.O. .. 54
Reading. Royal Berks. H.O. .. 54
Rotherham. Moorgate Gen. Reg. .. 54
Rugby. Hosp. of St. Cross & St. Mary's, Harborough Magna H.O. 54
Scotland. Western R.H.B. Sr. H.O. 55
Shoreham-by-Sea, Sussex. Southlands. Reg. 55
Southend-on-Sea. Gen. H.O. .. 55
Taplow. Canadian Red Cross Mem. H.O. 56
Welsh R.H.B. Reg. 56
Wolverhampton Group. H.O. .. 57

OPHTHALMOLOGY
Guy's, S.E.1. H.O. 45
South East Met. R.H.B. P.-t. Cons. 44
South London Hosp. for Women & Child., S.W.4. P.-t. M.O. (G.P.) .. 47
Birmingham & Midland Eye. H.O. 48
Bradford. Royal Eye & Ear. H.O. 48
Brighton. Sussex Eye. Sr. H.O. .. 48
Coventry & Warwickshire. Sr. H.O. 50
Manchester United Hosps. Sr. H.M.O. 44
Nottingham & Midland Eye Infy. Sr. H.O.'s 53

ORTHOPÆDICS
Birmingham R.H.B. Reg. 48
Bournemouth & East Dorset H.M.C. Reg. 49
Bradford. St. Luke's & Woodlands Hosp., Rawdon. Sr. H.O. & H.O. 48
Coventry & Warwickshire. Sr. H.O. 50
Gloucestershire Royal. Sr. H.O.'s .. 50
Grimsby Gen. Sr. H.O. or Locum .. 50
Hexham Gen. Jr. H.M.O. 51
Leeds R.H.B. H.O.'s 52
Leeds. St. James's. Sr. H.O. .. 52
Lewes. Chailey Heritage (Croft School & Hosp.). Sr. H.O. 51
Louth. County Infy. Sr. H.O. .. 51
Paisley & Dist. Hosps. B.O.M. Jr. H.M.O. 54
Salisbury Gen. H.O. 55
Scotland. South-Eastern R.H.B. Reg. 55
Sheffield. City Gen. H.O. 55
Wakefield. Pinderfields Gen. Sr. H.O.'s 56
Winchester Group H.M.C. Reg. .. 57
Woking. Rowley Bristow Orthopædic. Reg. 57
Wolverhampton Group. Sr. H.O. or H.O. 57
Yorkshire. East Riding H.M.C. H.O. 57
Dublin. Inc. Orthopædic Hosp. of Ireland. R.M.O. 57

PÆDIATRICS
Westminster Child's, S.W.1. Pre-reg. H.O. 47
Bath. Royal United. H.O. 47
Leeds R.H.B. H.O. 51
Leicester Royal Infy. Locum Sr. H.O. 51
Manchester United Hosps. H.O.'s .. 52
Mid-Glamorgan H.M.C. Sr. H.O. .. 53
Portsmouth Group H.M.C. Sr. H.O. & Pre-reg. H.O. 54
Sheffield. City Gen. H.O. 55
Shrewsbury. Royal Salop Infy. Sr. H.O. or H.O. 55
Southend-on-Sea. Gen. H.O. .. 55
Stoke-on-Trent. City Gen. H.O. .. 56
Tolworth, Surrey. Reg. 56
Windsor. King Edward VII. H.O. .. 57
Wolverhampton Group. H.O. .. 57

PATHOLOGY
Guy's, S.E.1. P.-t. Cons. 44
Royal Free, W.C.1. Locum H.O. .. 46
Birmingham United Hosps. Reg. .. 48
Liverpool R.H.B. Sr. H.M.O. .. 44
Manchester. West Manchester H.M.C. Sr. H.O. 53
Manchester. Withington. Sr. H.O. 53
Nottingham Gen. Sr. H.O. 54
Oldham Royal Infy. Sr. H.O. .. 54
Sheffield United Hosps. Sr. H.O. .. 55
Australia. Brisbane & South Coast Hosps. Board. Morbid Anatomist & Surg. Path. 45
Canada. Gen. Hosp. Pembroke, Ont. Pathologist 45

PHYSICAL MEDICINE
St. Mary's, W.2. P.-t. Reg. 46

PLASTIC SURGERY
Broxburn, West Lothian. Bangour Gen. Reg. 49
Chepstow, Mon. Sr. H.O. 49
Leeds R.H.B. Reg. 52

PSYCHIATRY
Marlborough Day, N.W.8. P.-t. Reg. 46
South East Met. R.H.B. P.-t. Psychiatrist 44
St. Thomas's, S.E.1. Sr. Reg. .. 47
Bexley, Kent. Sr. H.O. 48
Birmingham Group 9 H.M.C. Jr. H.M.O.'s 48
Bolton Dist. Gen. Sr. H.O. 49
Chichester. Graylingwell. Reg. .. 49
Colchester. Severalls. Locum Sr. H.M.O. 44
Derby. The Pastures. Jr. H.M.O. .. 50
Glasgow. Stobhill Gen. H.O.'s .. 50
Leeds R.H.B. Reg. 52
Newcastle Gen. H.O. 53
North East Met. R.H.B. Regs. .. 46
North West Met. R.H.B. Sr. H.M.O. 45
Scotland. Western R.H.B. Reg. 55
Southall, St. Bernard's Hosp. for Nervous & Mental Disorders. Reg. 55
Woodford Bridge, Essex. Claybury. Sr. H.O. 57

RADIOLOGY
Guy's, S.E.1. Reg. 45
Canada. Gen. Hosp. Pembroke, Ont. Radiologist 45

RADIOTHERAPY
Marie Curie, N.W.3. H.O. 46
Liverpool R.H.B. Cons. 44
Manchester R.H.B. Sr. Reg. .. 52
Nottingham Gen. Sr. H.O. or Reg. 53

SURGERY
German, E.8. Pre-reg. H.O. 45
Lambeth, S.E.11. H.O. 46
London Jewish, E.1. H.O. 46
Memorial, S.E.18. H.O.'s 46
Mile End, E.1. H.O. 46
New End, N.W.3. Pre-reg. H.O. .. 46
North East Met. R.H.B. Regs. .. 46
North Middlesex, N.18. H.O. .. 46
Royal Marsden, S.W.3. H.O. 46
South London Hosp. for Women & Child., S.W.4. Reg. 47
St. John's, S.E.13. Sr. H.O. 46
St. Leonard's, N.1. H.O. 47
Westminster Child's, S.W.1. H.O. .. 47
Aberdare Gen. Sr. H.O. 47
Ashford, Middx. H.O. 47
Ashton, Hyde and Glossop H.M.C. H.O. 47
Barnstaple. North Devon Infy. Pre-reg. H.O. 47
Birmingham. Dudley Road. Pre-reg. H.O. 48
Birmingham R.H.B. Reg. 48
Birmingham. Solihull. Pre-reg. H.O. 48
Brighton. Royal Alexandra Hosp. for Sick Child. H.O. 48
Caernarvon & Anglesey H.M.C. H.O.'s 49
Caerphilly Dist. Miners'. Sr. H.O. .. 49
Cardiff. Royal Hamadryad Gen. & Seamen's. Sr. H.O. 49
Carlisle. Cumberland Infy. H.O.'s 49
Carmarthen. West Wales Gen. Locum Sr. H.O. or H.O. 49
Chelmsford & Essex. Locum Reg. & Pre-reg. H.O. 49
Cheltenham Gen. & Eye. H.O. .. 49
Colchester H.M.C. H.O.'s 50
Crewe & Dist. Mem. H.O. 49
Dudley, Stourbridge & Dist. Pre-reg. H.O.'s 50
Enfield. Chase Farm. H.O. 50
Epping. St. Margaret's. Sr. H.O. .. 50
Epsom Dist. Reg. 50
Grantham & Kesteven Gen. Reg. .. 50
Halifax. Royal Halifax Infy. Sr. H.O. 50
Hastings. Royal East Sussex. Pre-reg. H.O. 50
Hastings. St. Helen's. Pre-reg. H.O. 50
Hertford County. H.O. 51
Hove Gen. H.O. 51
Huddersfield Royal Infy. H.O. .. 51
Hull. Kingston Gen. Pre-reg. H.O. .. 51
Hull. Victoria Hosp. for Sick Child. Locum H.O. 51
Kingston, Surrey. Pre-reg. H.O.'s .. 51
Leeds R.H.B. H.O.'s 51
Leigh (Lancs.) Infy. Pre-reg. H.O. 51
Luton & Dunstable. H.O.'s 52
Maidenhead. Reg. & H.O. 52
Maidstone. West Kent Gen. Pre-reg. H.O. 52
Mid-Glamorgan H.M.C. Sr. H.O. & H.O.'s 53
Newmarket Gen. H.O. 53
Nottingham Gen. Pre-reg. H.O.'s .. 54
Plymouth. South Devon & East Cornwall. Sr. H.O.'s & Pre-reg. H.O. 54
Portsmouth Group H.M.C. Reg. & Pre-reg. H.O.'s 54
Rhymney & Sirhowy Valleys H.M.C. H.O.'s 54
Romford. Victoria. H.O. 54
Ryde, I.W. Royal I.W. County. Pre-reg. H.O. 54
Scunthorpe War Mem. Sr. H.O. .. 55
Shrewsbury. Royal Salop Infy. Pre-reg. H.O. 55
South East Met. R.H.B. Reg. .. 55
Southend-on-Sea. Gen. H.O. .. 56
Southport Gen. Infy. H.O. 56
Stafford. Staffordshire Gen. Infy. Pre-reg. H.O. 56
St. Albans City. Locum Reg. .. 56
Stoke-on-Trent. Haywood. Jr. H.M.O. 56
Taunton H.M.C. H.O. 56
Torquay. Torbay. H.O. 56
Tynemouth Victoria Jubilee Infy. Jr. H.M.O. 56
Whitehaven, Cumberland. H.O. or Sr. H.O. 56
Wigan. Royal Albert Edward Infy. Pre-reg. H.O. 56
Windsor. King Edward VII. H.O. .. 57
Wolverhampton Group. H.O.'s .. 57
Worcester. Ronkswood. Pre-reg. H.O. 57

THORACIC SURGERY
Hosps. for Diseases of the Chest. Sr. H.O. & Sr. H.O. or Reg. 45
Cottingham, E. Yorks. Castle Hill. Jr. H.M.O. 50
Leeds R.H.B. H.O. 51
Wakefield. Pinderfields Gen. Sr. H.O.'s or Locum 56

PUBLIC APPOINTMENTS 57

NON-MEDICAL 58

MISCELLANEOUS 58

The Terms and Conditions of Service of Hospital Medical and Dental Staff apply to all N.H.S. hospital posts we advertise, unless otherwise stated. Canvassing disqualifies, but candidates may normally visit the hospital by appointment.

Academic and Educational

ROYAL COLLEGE OF SURGEONS OF ENGLAND
DEPARTMENT OF DENTAL SCIENCE

Applications are invited for the full-time post of LEVERHULME RESEARCH FELLOW IN BIOCHEMISTRY. The successful candidate will be expected to undertake research in relation to collagen formation and maintenance in the body and in addition will be free to follow other approved lines of biochemical research in relation to dental science, as a Member of the Leverhulme Research Team for Dental Research.

Facilities for research will be available both in the laboratories at the College and at the Buckston Browne Farm.

Salary will be within the University scale of £1250–£100–£1750 p.a. together with membership of F.S.S.U. The commencing salary will be determined by the age, qualifications and experience of the successful candidate.

The appointment will be for 3 years in the first instance.

Applications (3 copies), together with the names of 2 referees, should be sent not later than Friday, 15th July, 1955, to the Secretary, Faculty of Dental Surgery, Royal College of Surgeons of England, Lincoln's Inn-fields, London, W.C.2, from whom further particulars may be obtained.

W. F. DAVIS, Secretary, Faculty of Dental Surgery.

ROYAL COLLEGE OF SURGEONS OF ENGLAND
DEPARTMENT OF DENTAL SCIENCE

Applications are invited for the full-time post of LEVERHULME RESEARCH FELLOW IN ORAL PATHOLOGY. The successful candidate will be expected to undertake research in oral pathology as a Member of the Leverhulme Research Team for Dental Research, and should hold a medical or dental qualification.

Facilities for research will be available both in the laboratories at the College and at the Buckston Browne Farm.

The salary will be within the University scale either as Senior Lecturer or Reader according to experience, together with membership of F.S.S.U.

The appointment will be for 3 years in the first instance.

Applications (3 copies), together with the names of 2 referees, should be sent not later than Friday, 15th July, 1955, to the Secretary, Faculty of Dental Surgery, Royal College of Surgeons of England, Lincoln's Inn-fields, London, W.C.2, from whom further particulars may be obtained.

W. F. DAVIS, Secretary, Faculty of Dental Surgery.

UNIVERSITY OF MANCHESTER

A COURSE in preparation for the DIPLOMA IN PSYCHOLOGICAL MEDICINE will commence in OCTOBER, 1955, subject to a sufficient number of candidates being available. The instruction is part-time, occupying 3 half-days per week for 8 terms.

Further particulars as to regulations and fees may be obtained from the Dean of Postgraduate Medical Studies, The University, Manchester, 13, to whom application to take the course should be made not later than Friday, 24th June.

INSTITUTE OF NEUROLOGY (Queen-square)

2 COURSES OF CLINICAL DEMONSTRATIONS, open to Postgraduates, will be held at The National Hospital, Queen-square, on WEDNESDAYS at 4 P.M. from 29TH JUNE to 14TH SEPTEMBER, 1955, inclusive, and on SATURDAYS at 10.30 A.M. from 2ND JULY to 17TH SEPTEMBER, 1955, inclusive.

The fee for attending either of these courses is 1 guinea.

Application for a ticket should be made to the Dean, Institute of Neurology (Queen-square), The National Hospital, Queen-square, W.C.1, and a remittance to cover the fee enclosed. Only postal applications will be considered.

GEORGE HENRY LEWES STUDENTSHIP
ANNUAL VALUE £250

Applications are invited for the above Studentship which will be vacant on 1ST OCTOBER, 1955. The Student is required to give his whole time to research work except such as, in the opinion of the Trustees, does not interfere with his original inquiries.

Candidates should send (*a*) a statement of their qualifications, and their need of pecuniary help, (*b*) the subject of their proposed research, (*c*) the name of 1 referee, to Prof. Sir BRYAN MATTHEWS, Department of Physiology, Cambridge, by 15th July, 1955. The student is expected normally to work in the Department of Physiology, Cambridge, though in exceptional conditions he may obtain permission to work elsewhere.

CHELSEA POLYTECHNIC
Manresa-road, London, S.W.3
DEPARTMENT OF PHYSIOLOGY AND PHARMACOLOGY
Head : MARY F. LOCKETT, M.D.(LOND.), M.R.C.P., PH.D.(CANTAB.)

The Governing Body invite applications for the post of LECTURER or ASSISTANT (grade B) in Physiology or Pharmacology. Honours Degree essential. Duties include teaching and research. The successful candidate will be graded as Lecturer or Assistant (grade B) in accordance with qualifications and experience.

The salary scales attached to the various grades are as follows :—

(*a*) Lecturer : Men, £965–£1065 ; Women, £799 11s.–£1065, plus London allowance of £36 or £48 according to age. Placing on the scale will be in accordance with previous service in a similar capacity.

(*b*) Assistant grade B : Men, £525–£820 ; Women, £482 3s.–£820, plus additions for training and degree, and London allowance of £36 or £48 according to age. Placing on the scale will be in accordance with previous service in a similar capacity and/or industrial experience.

Further particulars and form of application may be obtained from the Clerk to the Governors, by whom applications should be received not later than 11th July, 1955.

NOTICE—GENERAL
BILTON POLLARD FELLOWSHIP IN CONNEXION WITH THE UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL

Notice is hereby given that the Minister of Education proposes after the expiration of 1 calendar month to establish a SCHEME under the Charitable Trusts Acts for the above Foundation. The proposed Scheme may be inspected on any weekday during 21 days from this date between 10 A.M. and 4 P.M. at the Secretary's Office, University College Hospital Medical School, University-street, London, W.C.1. Copies can be obtained at the Ministry of Education, Curzon-street, London, W.1.

Objections or suggestions may be sent in writing within 1 calendar month from this date to "The Secretary, Ministry of Education, Legal Branch, Curzon-street, London, W.1," quoting the following reference No. U1969Z/13.

Dated 6th June, 1955.

ROYAL SOCIETY AND NUFFIELD FOUNDATION COMMONWEALTH BURSARIES

Applications are invited for awards under the Royal Society and Nuffield Foundation Commonwealth Bursaries Scheme which was instituted to provide facilities for increasing the efficiency of scientists of proven worth by enabling them to pursue research, learn techniques or follow other forms of study in natural science in countries other than their own in the Commonwealth where the physical or personal environment or both are peculiarly favourable.

The bursaries provide travel, maintenance at a rate of about £600 a year depending on living costs and the applicant's circumstances and are tenable usually for periods of 2–12 months ; they are not intended to provide any salary as such. Bursars will not be permitted to prepare specifically for, or to take examinations for, higher degrees or diplomas.

For proposed visits beginning during the period from January to June, 1956, applications must be received complete with supporting documents not later than 15th September, 1955, by the Assistant Secretary, The Royal Society, Burlington House, London, W.1, from whom application forms and fuller particulars may be obtained.

THE ROYAL SOCIETY

GOVERNMENT GRANT FOR SCIENTIFIC INVESTIGATIONS

Applications for grants from the second allotment of the Government Grant for Scientific Investigations for the year 1955 should be made as soon as possible on forms of application to be obtained from the Assistant Secretary of the Royal Society, Burlington House, London, W.1. No application can be considered which is received later than 31ST JULY, 1955.

Applicants must be of British nationality, resident in Great Britain or Northern Ireland. Grants may be made for purposes in connection with the promotion and support of research in pure science other than for personal maintenance or payment of stipends ; for the assistance of scientific expeditions and collections ; but not in aid of scientific publications.

UNIVERSITY OF LONDON. The Senate invite applications for the READERSHIP IN ANATOMY tenable at St. Thomas's Hospital Medical School (salary £1450–£2050 a year).

Applications (10 copies) must be received not later than 27th July, 1955, by the Academic Registrar, University of London, Senate House, W.C.1, from whom further particulars should be obtained.

UNIVERSITY OF BRISTOL. The University invites applications for the appointment of LECTURER IN CHILD HEALTH. Salary scale £1200–£100–£1750 or £1750–£100–£2400 p.a. according to qualifications and experience, together with superannuation and children's allowances. The successful candidate will be granted an honorary contract with the Board of Governors of the United Bristol Hospitals and with the South-Western Regional Hospital Board as Consultant or Senior Registrar according to qualifications and experience. The Lecturer will be required to assist in the clinical, practical and theoretical teaching in the Department, including organisation of the teaching in preventive aspects of child health ; and to undertake research related to child health and paediatrics.

Applications (10 copies), stating age, qualifications and experience and including the names of 3 referees, should reach the undersigned, from whom further particulars may be obtained, not later than Monday, 11th July, 1955.

H. C. BUTTERFIELD, Registrar.

The University, Bristol, 8.

UNIVERSITY OF GLASGOW. Applications are invited for a SENIOR LECTURESHIP IN PUBLIC HEALTH. Salary scale : £1550–£100–£2050. Initial salary according to experience and qualifications. F.S.S.U. and family allowance benefits.

Applications (8 copies) should be lodged, not later than 30th June, 1955, with the undersigned, from whom further particulars may be obtained.

ROBT. T. HUTCHESON, Secretary of University Court.

UNIVERSITY OF ST. ANDREWS. The University Court invites applications for the post of ASSISTANT IN PHYSIOLOGY in St. Salvator's College. Candidates should possess an honours degree in physiology or biochemistry. The person appointed will be required, in addition to his teaching duties, to assist in research in the pharmacology and biochemistry of the central nervous system and preference will be given to candidates whose interests or experience lie in this field. The salary scale for Assistants under the age of 26 is £550 rising by annual increments of £25 to £600 ; for Assistants 26 or over the scale is £600 rising by annual increments of £25 to £650. The appointment also carries F.S.S.U. and family allowance benefits.

Applications (6 copies), with the names and addresses of referees, should be lodged not later than 30th June, 1955, with the undersigned.

D. M. DEVINE, Joint Clerk to the University Court.
College Gate, St. Andrews, 3rd June, 1955.

THE UNIVERSITY OF BIRMINGHAM. Faculty of MEDICINE. The University invites applications for the post of Whole-time LECTURER IN MEDICINE (grade II—Clinical) with clinical duties in the Medical Professorial Unit of the Queen Elizabeth Hospital. There are opportunities for research into problems of cardiovascular function. Salary range £700–£100–£1700 (plus F.S.S.U. and family allowance), depending on age, experience and qualifications. The appointment is for 3 years with the possibility of extension for a further year.

Applications (6 copies), with names of 3 referees, should reach the Assistant Registrar, The Medical School, Birmingham, 15, not later than 25th June, 1955. Further particulars may be obtained from the undersigned. G. L. BARNES, Secretary.

The University, Birmingham, 15, June, 1955.

THE UNIVERSITY OF BIRMINGHAM. Faculty of MEDICINE. The University invites applications for the post of Whole-time LECTURER IN PÆDIATRICS AND CHILD HEALTH (grade II—Clinical). Candidates must be Fellows or Members of the Royal College of Physicians, London, with experience in undergraduate teaching and an interest in research. Salary £700–£100–£1700 (efficiency bar at £1100) plus F.S.S.U. and family allowance depending on age, experience and qualifications.

Applications (6 copies), with names of 3 referees, should reach the Assistant Registrar, The Medical School, Birmingham, 15, not later than Saturday, 2nd July, 1955. Further particulars may be obtained from the undersigned.

G. L. BARNES, Secretary.

The University, Birmingham, 15, June, 1955.

ST. VINCENT'S HOSPITAL CLINICAL SCHOOL. UNIVERSITY OF MELBOURNE. Applications are called for the position of the JOHN HOLT DIRECTOR OF BIOCHEMICAL RESEARCH in the St. Vincent's Hospital School of Medical Research. The successful applicant will be in full charge of the Biochemical Research work but would merely have supervisory control over the hospital's routine Biochemical Department. The research laboratories have been newly built and occupy approximately 4500 square feet. Adequate funds are available for equipment. Initially the department staff will comprise the Director, 2 Assistant Biochemists and 2 Technicians. The assistant staff will be appointed on the advice of the Director. Study leave will be granted after a period of 5 years service. A limited amount of money for the attendance at important scientific meetings will be available. Salary is £3000 a year Australian currency; superannuation according to F.S.S.U. Reasonable travelling expenses to Melbourne will be paid for successful applicant and family. Assistance will be given in finding suitable accommodation. Further details and plans of the laboratories may be seen at the office of the Secretary of the Association of the Universities of the British Commonwealth, Gordon-square, London, W.C.1, or at St. Vincent's Hospital.

Closing date for applications 20th August. Arrangements will be made to interview selected overseas applicants in London between 23rd and 30th August.

E. W. R. GRACE, Chief Executive Officer and Secretary.

Hospital Services : Senior Appointments

GUY'S HOSPITAL, S.E.1. The Board of Governors invite applications for the appointment of DIRECTOR of the Department of Clinical Pathology. The appointment is of Consultant status in the National Health Service and will be on a maximum part-time sessional basis. Applicants are required to hold higher qualifications.

Applications (1 copy), together with the names of 3 referees, should be submitted to reach the Superintendent, Guy's Hospital, London, S.E.1, not later than 16th July, 1955. In accordance with Statutory Instrument No. 1259 of the National Health Service regulations, canvassing members of the Board or Advisory Appointments Committee will lead to disqualification.

HOSPITALS FOR DISEASES OF THE CHEST. Brompton HOSPITAL, S.W.3. The Board of Governors invites applications for the appointment of ASSISTANT PHYSICIAN (Consultant) tenable at Brompton Hospital. The appointment involves attendance for 1 notional half-day each week to conduct an outpatient clinic and in the first instance will be confined to those duties. Further information may be obtained on request. Candidates are required to be Fellows or Members of the Royal College of Physicians of London.

Applications (9 copies), stating date of birth, qualifications and experience with the names of 3 referees, are to reach the undersigned not later than 16th July, 1955.

KENNETH A. F. MILES, Secretary to the Board.

Brompton Hospital, S.W.3.

NATIONAL HOSPITALS FOR NERVOUS DISEASES. The Board of Governors invites applications for the appointment of ASSISTANT PHYSICIAN (Consultant status) at The Maida Vale Hospital for Nervous Diseases, Maida Vale, W.9. Candidates should be Members or Fellows of the Royal College of Physicians. The appointment will be part-time and the successful applicant will be required to attend 2 half-days per week.

Applications (35 copies), giving the names of 3 referees, must be submitted to the undersigned not later than 9th July, 1955.

H. EWART MITCHELL, Secretary to the Board of Governors.

The National Hospitals for Nervous Diseases,
Queen-square, W.C.1.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment, for 4–5 notional half-days, of REGIONAL PSYCHIATRIST who will act as adviser to the Board under the general supervision of the Senior Administrative Medical Officer. These sessions do not include work of a clinical nature. Salary in accordance with nationally negotiated terms.

Applications, with the names of 3 referees, should be received by the Senior Administrative Medical Officer, 11, Portland-place, London, W.1, by 9th July, 1955.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Part-time CONSULTANT OPHTHALMIC SURGEON to undertake 2 notional half-days a week in the Greenwich and Deptford Group of hospitals for duties at St. Alfege's Hospital, Vanbrugh-hill, S.E.10. Extensive experience in the specialty, including major ophthalmic surgery, is essential and the possession of a higher qualification is desirable. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales). Candidates may visit the hospital concerned.

Apply, stating nationality, age, sex, qualifications and experience, including details of present appointment and of war service, together with the names and addresses of 3 referees, to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 2nd July, 1955.

COLCHESTER. SEVERALLS HOSPITAL. Locum ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer grade) required for an indefinite period which may be for 12 months or longer. Single accommodation available.

Applications to the Medical Superintendent.

LEEDS REGIONAL HOSPITAL BOARD. Resident Whole-time ASSISTANT CHEST PHYSICIAN AND DEPUTY MEDICAL SUPERINTENDENT (Senior Hospital Medical Officer scale) at the Castle Hill Sanatorium, Cottingham, East Yorks. The person appointed will have charge of beds under the direct supervision of the Medical Superintendent and visiting Chest Consultants and will also be required to attend occasionally at Raywell and Driffield Sanatoria and Chest Clinics in the Hull area. There is a Thoracic Surgical Unit of 51 Beds at the adjacent Castle Hill Hospital.

Applications (12 copies), stating age, qualifications and details of appointments held, showing dates, with names and addresses of 3 referees, to the Secretary, Park-parade, Harrogate, not later than 9th July, 1955.

LIVERPOOL REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time post of ASSISTANT PATHOLOGIST to the Liverpool and District Eastern Hospital Management Committee with duties mainly at Broadgreen Hospital. Experience in all branches of hospital pathology is desirable especially in transfusion serology and chest pathology. The successful candidate will have a special responsibility for the Hospital Transfusion Unit at Broadgreen Hospital. Salary £1500 (at age 32)–£50–£1950 p.a.

Forms of application from, and to be returned to, Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be received not later than 25th June, 1955.

VINCENT COLLINGE, Secretary to the Board.

LIVERPOOL REGIONAL HOSPITAL BOARD. United LIVERPOOL HOSPITALS. Applications are invited for the post of Whole-time CONSULTANT RADIOTHERAPIST to work under the administrative control of the Director of the Radiotherapeutic Services at the Radium Institute, from whom any further information should be obtained. Applicants must possess a Diploma in Radiotherapy and preference will be given to candidates holding an additional qualification. The appointment is tenable from 3rd September, 1955.

Forms of application from, and to be returned to, Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be received not later than 6th July, 1955.

VINCENT COLLINGE, Secretary to the Board.

MANCHESTER. UNITED MANCHESTER HOSPITALS. MANCHESTER ROYAL EYE HOSPITAL. Applications are invited for the post of Full-time SENIOR HOSPITAL MEDICAL OFFICER (non-resident). Previous experience in ophthalmology essential. The terms and conditions of service for hospital medical and dental staffs will apply.

Applications, giving details of past experience and qualifications, together with the names of 3 referees, to be addressed to the undersigned as early as possible. (Special application forms can be obtained on request.)

F. J. CABLE, Secretary, United Manchester Hospitals.

NEWCASTLE REGIONAL HOSPITAL BOARD. Special AREA FOR CUMBERLAND AND NORTH WESTMORLAND. WEST CUMBERLAND GROUP OF HOSPITALS. Locum ANÆSTHETIST required for August and September. Remuneration at Consultant or Senior Hospital Medical Officer level according to qualifications and experience.

Applications immediately to Senior Administrative Medical Officer, 72, Warwick-road, Carlisle.

SOUTH-WESTERN REGIONAL HOSPITAL BOARD. UNITED BRISTOL HOSPITALS. Applications are invited for the post of Part-time CONSULTANT E.N.T. SURGEON to the South-Western Regional Hospital Board and the United Bristol Hospitals. The appointment will be for 9 sessions: initially 7 will be in Regional Board Hospitals in the Bristol Clinical Area and 2 in the United Bristol Hospitals.

Applications (1 copy only), with the names of 3 referees, should be sent to the Secretary, Bristol Royal Infirmary, Bristol, 2, from whom further particulars can be obtained, not later than 13th July, 1955.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Whole-time or maximum Part-time CONSULTANT DENTAL SURGEON to the Oral Surgery Department, Plastic and Oral Surgery Centre, Odstock Hospital, Salisbury. A higher qualification in dental surgery and considerable experience in oral and maxillo-facial surgery are essential. Applicants may visit the Hospital by arrangement with Mr. J. T. MASON, A.H.A., Group Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury, Wilts.

Applications (5 copies), stating age, qualifications, experience, and names and addresses of 3 referees, to the Area Secretary, "Highcroft," Romsey-road, Winchester, by 28th June, 1955.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Whole-time SENIOR CASUALTY OFFICER (salary scale £1500–£50–£1950) for the Redhill (Surrey) Group of hospitals. Tenure of post not to exceed 4 years. Applicants should possess good experience in general and orthopædic surgery. Successful candidate will be required to supervise all casualty work.

Applications (5 copies), giving date of birth, qualifications, experience, and names of 3 referees, to Secretary (S.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 8th July, 1955. Applicants may visit hospitals by local arrangement.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Whole-time ASSISTANT CHEST PHYSICIAN (Senior Hospital Medical Officer grade) for the City of Portsmouth. The successful applicant will have duties at the City Chest Clinics and in connection with the preventive and aftercare services of the Portsmouth City Council. He will also be employed at the Infectious Diseases and St. Mary's Hospitals, Portsmouth (160 tuberculosis beds). There is a major Thoracic Unit at the latter hospital. The post will be vacant on 26th July, 1955.

Applications (6 copies), stating age, qualifications, experience, and names and addresses of 3 referees, to the Area Secretary, "Highcroft," Romsey-road, Winchester, by 28th June, 1955. Applicants may visit the clinics and hospitals by arrangement with Mr. L. C. ROGERS, M.R.SAN.I., Acting Group Secretary, Portsmouth Hospital Management Committee, 35, Grove-road South, Southsea, Hants.

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.

ASSISTANT PSYCHIATRIST (whole-time), Senior Hospital Medical Officer grade, Harperbury Hospital, Harper-lane, Shenley, Herts (1464 Beds for mental defectives). Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 18th July, 1955.

CANADA. GENERAL HOSPITAL, Pembroke, Ontario. Required, a PATHOLOGIST, also a full-time certified RADIOLOGIST for a 200-bed General Hospital.

Please give personal particulars with qualifications and experience. Applications to Mother Superior.

NEW ZEALAND. WAIKATO HOSPITAL BOARD, HAMILTON, NEW ZEALAND. Applications are invited from Junior or Senior Specialists for the position of Full-time ANÆSTHETIST at Waikato Hospital, Hamilton, New Zealand. Waikato Hospital has some 650 Beds, and the Department of Anæsthesia at present comprises 4 part-time Anæsthetists and 2 Anæsthetic Registrars, as well as the full-time Anæsthetic Specialist. The position is a non-resident one and will be vacant as from 1st October, 1955. Salary in accordance with hospital employment regulations and within the range of £NZ1290–£NZ1590 p.a. for a Junior Specialist and £NZ1690–£NZ2190 p.a. for a Senior Specialist. The salary scale is increased by a cost-of-living bonus amounting to £81 7s. p.a. A furnished 2-bedroom residence is available for a limited term.

Conditions of appointment, accompanying explanatory memorandum and form of application obtainable from the High Commissioner for New Zealand, 415, Strand, London, W.C.2. Ref. No. 3/6/7. Completed applications close in New Zealand on 30th July, 1955, and must reach the High Commissioner's Office, London, not later than 16th July, 1955.

AUSTRALIA. BRISBANE AND SOUTH COAST HOSPITALS BOARD, BRISBANE. Applications are invited for appointment to the Senior staff in the Department of Pathology at the Brisbane Hospital, Brisbane, Queensland. Vacancies exist as follows :—

MORBID ANATOMIST.
SURGICAL PATHOLOGIST.
BIOCHEMIST.
BACTERIOLOGIST.
HÆMATOLOGIST.

Appointees will be responsible to the Director of the Laboratories for the supervision and control of sections of the Laboratories and will be required to develop some aspect of investigational work related to problems of the Hospital and to undertake such fundamental work as may be decided incidental thereto. They will be expected to assist the training of Registrar Pathologists and Technicians and to undertake certain lectures and demonstrations. The Laboratories at present serve the Brisbane Hospital, the Brisbane Women's Hospital, the Children's Hospital and the Queensland Radium Institute, the total number of beds being about 2000 and offer a very great range of material. The Hospitals are the major teaching hospitals for the University of Queensland. Applicants should normally hold a medical qualification, and should have had considerable experience in the fields represented by the appointments, preferably in the laboratories of a teaching hospital, but applications from suitably qualified and experienced non-medical graduates will receive consideration for appointment as Biochemist and Bacteriologist. The salary range offered for medically qualified appointees is £2120–£2370, plus future basic wage adjustments. Non-medical personnel with suitable high qualifications and experience are invited to state the salary at which they would be prepared to accept appointment. Travelling expenses to Brisbane will be defrayed by the Board, subject to certain conditions. Interested persons are advised to communicate in the first instance with the Director of Pathology for full information and for any specific details that may be required.

Applications, stating in detail full personal particulars, academic and professional qualifications and experience, including a recent photograph and naming 3 persons as referees, should be forwarded in triplicate to reach the Manager, Brisbane and South Coast Hospitals Board, Herston-road, Brisbane, Queensland, Australia, by 6th August, 1955.

WESTERN AUSTRALIA. ROYAL PERTH HOSPITAL. The Board of Management invites applications for the position of Whole-time ASSISTANT DIRECTOR OF ANÆSTHESIA. Salary range £2270–£2320–£2390–£2440 (Australian) p.a., with periodical cost-of-living adjustment. Commencing salary rate is dependent upon qualifications and experience.

Applications, detailing age, marital status, qualifications, experience, war service, &c., must reach the undersigned by 30th September, 1955. A memorandum of further particulars concerning this position will be supplied on request.

JOSEPH GRIFFITH, Administrator.

Hospital Services : Junior Appointments

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. 2 RESIDENT HOUSE OFFICERS required in Gastroenterological Department : 1 pre-registration, 1 post-registration. Appointments from 1st August, 1955.

Applications, with 2 testimonials, to Medical Director by 25th June, 1955.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. RESIDENT HOUSE OFFICER (pre-registration) required in General Medical Department, including hæmatology and endocrinology. Appointment for 6 months from 1st August, 1955.

Applications, with 2 testimonials, to Medical Director by 25th June, 1955.

GERMAN HOSPITAL, London, E.8. (General—157 Beds.) Pre-registration HOUSE SURGEON. Post vacant 3rd July.

Apply, with copy testimonials, to Group Secretary, Hackney Hospital, E.9, quoting GH/PHS.

GERMAN HOSPITAL, London, E.8. (General—157 Beds.) Pre-registration HOUSE PHYSICIAN. Post vacant 3rd July.

Apply, with copy testimonials, to Group Secretary, Hackney Hospital, E.9, quoting GH/PHP.

GUY'S HOSPITAL, S.E.1. Applications are invited for the post of TRAINEE REGISTRAR in Diagnostic Radiology. Applicants should hold a higher qualification in medicine or surgery. The holder of this post will be remunerated at the rate for the grade of Registrar. Duties commence 1st October, 1955, with appointment for 2 years subject to review at the end of the first year, during which time the holder will be expected and given the opportunity to obtain a radiological qualification.

Forms of application are obtainable from, and should be lodged with, the Superintendent, Guy's Hospital, S.E.1, not later than 28th June, 1955.

GUY'S HOSPITAL, S.E.1. Applications are invited for the appointment of REGISTRAR in the B.M.R. and Endocrine Department (first year, 6 sessions per week). Duties to commence on 1st October, 1955.

Forms of application, obtainable from the Superintendent, Guy's Hospital, should be forwarded not later than 30th June, 1955.

GUY'S HOSPITAL. Applications are invited for the post of OPHTHALMIC HOUSE SURGEON (post-registration), non-resident, duties to begin on 1st July, 1955.

Applications (1 copy), accompanied by 2 testimonials, should reach the Superintendent, Guy's Hospital, London, S.E.1, not later than 24th June, 1955.

GUY'S HOSPITAL. Applications are invited for the post of DERMATOLOGICAL HOUSE PHYSICIAN (post-registration), non-resident, duties to begin on 1st July, 1955.

Applications (1 copy), accompanied by 2 testimonials, should reach the Superintendent, Guy's Hospital, S.E.1, not later than 24th June, 1955.

HOSPITAL OF ST. JOHN AND ST. ELIZABETH, 60, Grove End-road, London, N.W.8. Applications are invited from medical practitioners (Male) for the appointment of HOUSE SURGEON to the Midwifery and Gynæcology Departments, to become vacant on 4th July. Appointment will be for a period of 6 months. National Health Service salary.

Applications to reach the Secretary on or before Thursday, 23rd June, 1955, together with copies of 3 recent testimonials.

HOSPITALS FOR DISEASES OF THE CHEST. The LONDON CHEST HOSPITAL. A vacancy occurs for RESIDENT SURGICAL OFFICER, appointment for 6 months, with prospect of renewal. Post graded as Senior House Officer or Registrar according to qualifications and experience. Previous surgical experience necessary.

Applications, stating age, qualifications with dates, and previous appointments held, should be forwarded at once to—

THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

HOSPITALS FOR DISEASES OF THE CHEST. London CHEST HOSPITAL. RESIDENT HOUSE SURGEON required at the Hospital's Country Branch, near Hitchin and Letchworth, Herts. The post is graded as Senior House Officer and the appointment, which provides excellent opportunities for experience in thoracic surgery, is for 6 months.

Applications from registered medical practitioners, stating age, qualifications with dates, and previous appointments held, with copies of 3 testimonials, should be forwarded at once to—

THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

HOSPITALS FOR DISEASES OF THE CHEST. London CHEST HOSPITAL. Applications are invited for the appointment of Part-time MEDICAL REGISTRAR (grading : Senior Registrar). The duties require the equivalent of 5 notional half-days a week, including 1 Refill Clinic. The appointment is for 1 year from 1st September, 1955, and is renewable.

Applications, stating age, qualifications with dates, and previous appointments held and accompanied by copies of 3 testimonials, should reach the undersigned not later than 25th June.

THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

HOSPITALS FOR DISEASES OF THE CHEST. London CHEST HOSPITAL. 2 vacancies occur 1st August, 1955, for RESIDENT HOUSE PHYSICIAN. Appointments for 6 months, 4 in London, 2 at the Country Branch, near Letchworth, and posts graded as House Officer. Duties include work in the Outpatient Department and Refill Clinic as well as in wards.

Applications, stating age, qualifications with dates, and previous appointments held, with copies of 3 testimonials, should reach the undersigned not later than 25th June.

THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

HIGHLANDS GENERAL HOSPITAL. Winchmore Hill, London, N.21. SENIOR HOUSE OFFICER (resident) for Tuberculosis Unit (100 Beds), vacant 1st July.

Applications, with copies of 3 testimonials, to Hospital Secretary.

LAMBETH HOSPITAL, Brook-drive, S.E.11. Applications are invited from pre-registration and registered medical practitioners, for appointment as RESIDENT HOUSE SURGEON, vacant 23rd July, 1955. The appointment is for 6 months, and is recognised for the F.R.C.S.

Apply to the Physician-Superintendent.

LONDON HOSPITAL, Whitechapel, E.1. Applications are invited for the post of REGISTRAR to the Department of Anæsthetics. The post becomes vacant mid-July. D.A. or D.A. standard an advantage.

Applications (12 copies), giving the names and addresses of 3 referees, should be received by the House Governor by 30th June, 1955. H. BRIERLEY, House Governor.

LONDON JEWISH HOSPITAL, Stepney Green, E.1. (130 Beds.) HOUSE SURGEON (pre- or post-registration) required for 6 months.

Applications, with copies of testimonials, to be sent to the Hospital Secretary.

MARIE CURIE HOSPITAL, 66, Fitzjohn's-avenue, Hampstead, N.W.3. Applications are invited from registered medical practitioners for the post of GYNÆCOLOGICAL HOUSE SURGEON (radiotherapy), vacant immediately.

Applications, with copies of testimonials, to the Administrative Officer.

MARLBOROUGH DAY HOSPITAL, 38, Marlborough-place, N.W.8. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. PSYCHIATRIC REGISTRAR for 3 sessions per week to commence as soon as possible. Successful applicant required to undergo personal analysis which will be given free of charge. Clinic may be visited by direct appointment.

Application forms obtainable from, and returnable to, Group Secretary, Central Middlesex Group Hospital Management Committee, Acton-lane, N.W.10, by 29th June, 1955.

MEMORIAL HOSPITAL, Shooters Hill, Woolwich, S.E.18. HOUSE SURGEONS. 2 posts vacant 16th July. Recognised for F.R.C.S. Approved for Pre-registration Service.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

MEMORIAL HOSPITAL, Shooters Hill, Woolwich, S.E.18. HOUSE SURGEON (gynæcology and obstetrics), vacant 1st July. Recognised for M.R.C.O.G. for gynæcology. Small Obstetric Unit (20 Beds).

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

METROPOLITAN EAR, NOSE AND THROAT HOS-PITAL at St. Mary Abbots Hospital, Marloes-road, Kensington, W.8. FULHAM AND KENSINGTON HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON (E.N.T.) required immediately. Hospital recognised for D.L.O. Resident appointment for 6 months in first instance.

Applications by 24th June, 1955, on forms obtainable from the Hospital Secretary (L.122), St. Mary Abbots Hospital.

MILE END HOSPITAL, Bancroft-road, E.1. (475 Beds.) HOUSE SURGEON (pre- or post-registration). Post vacant 19th July, 1955.

Application forms, obtainable from Physician-Superintendent, to be returned by 1st July, 1955, with copies of not more than 3 testimonials.

NEW END HOSPITAL, London, N.W.3. Applications are invited for the post of HOUSE SURGEON (pre-registration), General Surgery, vacant 1st July, 1955.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials and name of 1 referee, to Surgeon-Superintendent, New End Hospital, Hampstead, N.W.3.

NORTH EAST METROPOLITAN REGIONAL HOS-PITAL BOARD.

MEDICAL REGISTRAR (non-resident), Connaught Hospital, E.17. Post tenable until 28th February, 1957.

SURGICAL REGISTRAR (resident), Connaught Hospital, E.17. Recognised for F.R.C.S.

SURGICAL REGISTRAR (resident), St. Andrew's Hospital, Billericay.

REGISTRAR in Psychiatry (resident or non-resident), Claybury Hospital, Woodford Green, Essex. Hospital has 2200 Beds, turnover 1300 a year, outpatient clinics at General Hospitals, all forms of treatment, training for D.P.M., and facilities to attend London lectures for diploma. Hospital less than 1 hour from London.

REGISTRAR in Obstetrics and Gynæcology (non-resident), North Middlesex Hospital and Annexes, Silver-street, Edmonton, N.18. Candidates should have, or be about to sit for, M.R.C.O.G.

REGISTRAR in Mental Deficiency (house or single quarters available), Royal Eastern Counties Hospital, Colchester, Essex (1700 Beds). Full opportunities for experience and instruction in all aspects of mental deficiency and for D.P.M.

Appointments subject to review after 1 year.

Separate applications in duplicate, with 2 copies of 2 recent testimonials, to Secretary, 11a, Portland-place, W.1, by 2nd July, 1955.

NORTH MIDDLESEX HOSPITAL, Edmonton, N.18. 2 OBSTETRIC AND GYNÆCOLOGICAL HOUSE SURGEONS (resident) required for 1st August, 1955 :—

(*a*) Registered medical practitioner.

(*b*) Pre-registration candidate (second post).

Both posts recognised by R.C.O.G. for Diploma, and as a combined post for Membership. Candidates must have held house appointments in either medicine or surgery. Large Obstetric and Gynæcological Department.

Applications (in own handwriting), stating age, nationality, qualifications, experience, with copies of recent testimonials, to Secretary of Hospital by 28th June.

NORTH MIDDLESEX HOSPITAL, Edmonton, N.18. HOUSE SURGEON (general surgery), resident, required for 1st August, 1955, for 6 months. Approved as pre-registration (first or second) post. Recognised for training for F.R.C.S.

Applications, stating age, nationality, qualifications, experience, with copies of recent testimonials, to Secretary of Hospital, by 28th June.

PRINCESS BEATRICE HOSPITAL, Earls Court, S.W.5. Applications are invited from registered medical practitioners for the post of HOUSE PHYSICIAN for 6 months. Vacancy from 1st August, 1955.

Applications, stating age, qualifications, and with not more than 3 testimonials, to House Governor, not later than 30th June, 1955.

REGIONAL NEUROSURGICAL CENTRE. (68 Beds.) BROOK GENERAL HOSPITAL, Shooters Hill-road, S.E.18. SENIOR HOUSE OFFICER (neurosurgery), vacant 1st July. Post recognised for F.R.C.S. and provides excellent opportunity for training in neurology.

Apply to Group Secretary, Memorial Hospital, Woolwich, S.E.18.

ROYAL FREE HOSPITAL. Applications are invited from registered Men and Women practitioners for the post of Locum RESIDENT ASSISTANT PATHOLOGIST (House Officer grade) at the Royal Free Hospital for the months of July and August. Duties to commence 1st July, 1955.

Application forms may be obtained from the Secretary to the Board of Governors, Royal Free Hospital, Gray's Inn-road, W.C.1, to whom they should be returned not later than 24th June, 1955.

ROYAL LONDON HOMŒOPATHIC HOSPITAL, Great Ormond-street and Queen-square, W.C.1. Applications are invited from registered medical practitioners for the appointment of HOUSE PHYSICIAN, vacant 15th August, 1955. 6 months appointment. Salary on National Health Service scale. Candidates will be required to attend for interview.

Applications, stating age and full particulars, to Secretary.

ROYAL MARSDEN HOSPITAL (formerly Royal Cancer Hospital), Fulham-road, London, S.W.3. Applications are invited from registered medical practitioners for the post of HOUSE SURGEON (resident) to commence duty on 11th August. Salary £525 p.a. The post is tenable for 6 months.

Forms of application are obtainable from the House Governor, to whom applications, together with copies of 3 recent testimonials, should be sent not later than 6th July.

ROYAL MARSDEN HOSPITAL (formerly Royal Cancer Hospital), Fulham-road, London, S.W.3. There is a vacancy for a Full-time ANÆSTHETIC REGISTRAR (Registrar grade), non-resident, to commence duties as soon as possible. Appointment for 1 year, eligible for re-election. As a part of the duties of appointment, the successful candidate will be expected to undertake research work on anæsthesia and related subjects.

Applications, on a form which will be supplied by the House Governor, with copies of 3 recent testimonials, to be sent by 4th July, 1955, to the House Governor.

ROYAL NATIONAL THROAT, NOSE AND EAR HOS-PITAL, Gray's Inn-road, W.C.1, and Golden-square, W.1. RESIDENT HOUSE SURGEON (post-registration post). Applications are invited for a 6 months appointment as from 1st August, 1955, with salary and conditions as laid down for House Officers in the terms and conditions of service in the National Health Service.

Applications, stating age, qualifications, full details of previous experience (particularly in this specialty), with copies of 1–3 recent testimonials, should be sent to the House Governor immediately.

ROYAL NORTHERN HOSPITAL, Holloway, N.7. (279 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time E.N.T. REGISTRAR required at above Hospital. Experience in Hearing Aid Clinics an advantage. Candidates may visit the Hospital by direct appointment.

Application forms obtainable from, and returnable to, the Secretary, Royal Northern Hospital, N.7, by 28th June, 1955.

ST. MARY'S HOSPITAL, London, W.2. Applications are invited from suitably qualified practitioners for the post of Part-time CLINICAL ASSISTANT to the Department of Physical Medicine at St. Mary's Hospital for 4 notional half-days per week; graded Registrar. The appointment is for a first period of 12 months and the successful candidate will be required to take up his duties as soon as possible.

Applications, stating nationality, date of birth, permanent address, qualifications with dates, details and National Health Service gradings of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, by 29th June, 1955.

ST. JOHN'S HOSPITAL, Lewisham, London, S.E.13. Applications are invited for the resident post of SENIOR HOUSE SURGEON at the above Hospital, vacant on 1st July, and recognised for 6 months training for F.R.C.S. Salary £745 p.a., less £150 for residential emoluments.

Applications, stating age, qualifications, and experience, with copy testimonials or names of referees, should be addressed to the Secretary, Group Offices, Lewisham Hospital, London, S.E.13.

ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN, Lisle-street, Leicester-square, London, W.C.2. Applications are invited for the appointment of a Full-time SENIOR REGISTRAR. Candidates should have special experience in dermatology and possession of a higher qualification is desirable. Appointment is subject to the terms and conditions of service of hospital medical and dental staffs.

Applications addressed to the Secretary to the Board of Governors, stating age, qualifications and experience, with names of 3 referees, should be received by 30th June, 1955.

ST. LEONARD'S HOSPITAL, Nuttall-street, London, N.1. (General—192 Beds.) Applications are invited from registered or provisionally registered medical practitioners for the post of HOUSE PHYSICIAN for 6 months commencing 9th July, 1955.

Applications, with 2 recent testimonials, to be sent to the Hospital Secretary by 2nd July, 1955. Applications may be sent in pending the qualifying examination results being known, and providing these are available at the date of interview, which will be approximately first week in July.

ST. LEONARD'S HOSPITAL, Nuttall-street, London, N.1. (Acute General—192 Beds.) Applications are invited from registered or provisionally registered medical practitioners for the post of HOUSE SURGEON. Post vacant 12th July, 1955.

Applications, with copies of 2 testimonials, to the Hospital Secretary by 25th June, 1955.

ST. LEONARD'S HOSPITAL, Nuttall-street, London, N.1. (192 Beds.) Applications are invited for the post of RESIDENT ANÆSTHETIST (Senior House Officer) with additional duties in the Group. The post is recognised for the D.A. Good opportunities will be given to study for higher qualifications.

Applications, with 2 recent testimonials, to the Hospital Secretary by 25th June, 1955.

ST. STEPHEN'S HOSPITAL, Chelsea, S.W.10. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR (obstetrics and gynæcology), whole-time. Non-resident. Vacancy 1st October, 1955. Not recognised for M.R.C.O.G.

Application forms from Group Secretary, St. Luke's Hospital, Sydney-street, Chelsea, S.W.3 (enclose foolscap stamped addressed envelope).

ST. THOMAS'S HOSPITAL, London, S.E.1. Senior REGISTRAR in the Department of Psychological Medicine which has an inpatient unit and outpatient diagnostic and treatment clinics. 1 year in the first instance.

Applications, including names and addresses of 2 referees, to the Clerk of the Governors by 2nd July, 1955.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in Anæsthetics to fill a vacancy in the approved trainee establishment at the Bermondsey and Southwark Group of hospitals, available on 1st September, 1955. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 2nd July, 1955.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as REGISTRAR in E.N.T. Surgery at the Lewisham Group of hospitals, London, S.E., for duties at Lewisham and St. John's General Hospitals and in a special E.N.T. Surgical Unit of 38 Beds at Park Hospital, Hither Green. The appointment is recognised for D.L.O. and F.R.C.S. and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications, and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 2nd July, 1955.

SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN, Clapham Common, S.W.4. Female MEDICAL OFFICER (1 session per week) required in the Ophthalmic Department for duties with the Consultant in Ophthalmology. Salary G.P. rate—£175 p.a. per session. Some experience essential and preference given to candidates holding the Diploma in Ophthalmology.

For forms of application apply to the Group Secretary, Lambeth Group Hospital Management Committee, Renfrew-road, S.E.11, to whom completed applications should be returned not later than 2nd July, 1955.

SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN, Clapham Common, S.W.4. **SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.** Applications are invited from registered Female medical practitioners for the post of Full-time SURGICAL REGISTRAR which will become vacant on 3rd August, 1955. Recognised for the F.R.C.S. The successful candidate will be required to be resident or within 20 minutes distance of the Hospital. The appointment is normally for 2 years, but subject to review at the end of the first year. Canvassing will disqualify but candidates are not precluded from visiting the Hospital if they so desire.

For form of application, apply (enclosing stamped addressed envelope) to the Secretary, Lambeth Group Hospital Management Committee, to whom completed applications should be returned not later than 1st July, 1955.

SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN, Clapham Common, S.W.4. Applications are invited from registered Women medical practitioners for the appointment of RESIDENT MEDICAL OFFICER at the above Hospital. Senior House Officer grade. Appointment for 1 year. Duties include care of Children's Ward. Vacant 16th July, 1955.

Application forms from the Secretary.

WANSTEAD HOSPITAL, Harmon Hill, E.11. (191 Beds.) Applications are invited for the post of CASUALTY OFFICER graded Senior House Officer, vacant 8th July, 1955. Salary £745 p.a., less £150 p.a. for board, lodging, &c.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to the Secretary, Hospital Management Committee Forest Group, Langthorne-road, E.11.

WESTMINSTER CHILDREN'S HOSPITAL. WESTMINSTER HOSPITAL TEACHING GROUP.

HOUSE PHYSICIAN (second pre-registration) required for 6 months from 1st August, 1955.

HOUSE SURGEON (post-registration or second pre-registration) required for 6 months from 1st September, 1955.

Applications, with copies of recent testimonials, should be sent to the Secretary, Westminster Children's Hospital, Vincent-square, S.W.1, by 2nd July, 1955.

WESTMINSTER HOSPITAL, St. John's-gardens, S.W.1. Applications invited for post of Locum Tenens SENIOR MEDICAL REGISTRAR for 8 months from 26th July, 1955.

Applications (7 copies), with names of 2 referees, to House Governor by 28th June.

ABERDARE GENERAL HOSPITAL, Aberdare. (102 Beds.) MERTHYR AND ABERDARE HOSPITAL MANAGEMENT COMMITTEE. RESIDENT SENIOR HOUSE OFFICER. Vacancy 1st August, 1955. Duties include those in general surgery, general medicine, gynæcology, obstetrics and pædiatrics. National Health Service terms and conditions of service.

Applications, with full particulars, to Group Secretary, Merthyr and Aberdare Hospital Management Committee, St. Tydfil's Hospital, Merthyr Tydfil.

ABERDEEN GENERAL HOSPITALS BOARD OF MANAGEMENT. Applications are invited for the appointment of a JUNIOR HOSPITAL MEDICAL OFFICER in General Medicine at the Aberdeen Royal Infirmary and Woodend General Hospital. Conditions of service in accordance with the terms issued by the Department of Health for Scotland.

Applications, with the names of 2 referees, should be lodged with the Secretary, Aberdeen General Hospitals, P.O. Box No. 92, 62, Queen's-road, Aberdeen, within 14 days of the appearance of this advertisement.

ABERDEEN GENERAL HOSPITALS BOARD OF MANAGEMENT. Applications are invited for the appointment of REGISTRAR in General Medicine at the Aberdeen Royal Infirmary and Woodend General Hospital. Conditions of service in accordance with the terms issued by the Department of Health for Scotland.

Applications, with the names of 2 referees, should be lodged with the Secretary, Aberdeen General Hospitals, P.O. Box No. 92, 62, Queen's-road, Aberdeen, within 14 days of the appearance of this advertisement.

ASHFORD HOSPITAL, Ashford, Middlesex. Staines GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT HOUSE OFFICER (Male) for general surgical and medical duties. Post not suitable for pre-registration candidates.

Applications, stating age, qualifications, and experience, with copies of up to 3 recent testimonials, immediately.

ASHTON, HYDE AND GLOSSOP HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required at Ashton-under-Lyne General Hospital. Preference will be given to pre-registration applicants. Recognised for F.R.C.S. (Eng.).

Applications, stating age, nationality, qualifications and experience, together with copies of 3 testimonials, should be forwarded to the Group Secretary, Ashton-under-Lyne General Hospital, Ashton-under-Lyne, as soon as possible.

ASHTON, HYDE AND GLOSSOP HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN required at Ashton-under-Lyne General Hospital. Preference given to pre-registration applicants.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 testimonials, should be forwarded to the Group Secretary, Ashton-under-Lyne General Hospital, Ashton-under-Lyne, Lancs, as soon as possible.

AYLESBURY. STOKE MANDEVILLE HOSPITAL. RESIDENT HOUSE PHYSICIAN for the Department of Medicine. Recognised pre-registration post. Applications from registered practitioners will be considered. Post vacant immediately.

Apply, with copies of 2 testimonials, to Administrative Officer.

BARNSTAPLE. NORTH DEVON INFIRMARY. (110 Beds.) HOUSE SURGEON (pre-registration). Post vacant mid-July.

Applications to Group Secretary, North Devon Hospital Management Committee, 19, Alexandra-road, Barnstaple.

BATH. ROYAL UNITED HOSPITAL. Applications are invited from medical practitioners for the post of HOUSE PHYSICIAN (pædiatrics) at the above Hospital. Appointment is recognised for D.C.H. qualification and will be vacant beginning of August.

Applications, stating age, qualifications and experience, with 3 testimonials, should be forwarded to the Group Secretary, Bath Hospital Management Committee, Manor Hospital, Combe Park, Bath, by 2nd July, 1955.

BIRMINGHAM, 17. LORDSWOOD MATERNITY HOSPITAL, Lordswood-road. RESIDENT OBSTETRIC HOUSE OFFICER, commencing 27th July approximately. 35 Beds dealing with normal and abnormal midwifery. Recognised for D.Obst.R.C.O.G. and as pre-registration post. Second period training school for Pupil Midwives.

Applications to Obstetrician not later than 25th June, 1955.

BIRMINGHAM, 13. SORRENTO MATERNITY HOSPITAL. (112 Beds, including 24 premature baby cots.) OBSTETRIC HOUSE SURGEON. Recognised for D.Obst. R.C.O.G. Hospital affiliated to Birmingham Medical School for training of students. Vacant 1st August.

Apply Obstetrician by 29th June, 1955.

BIRMINGHAM AND MIDLAND EYE HOSPITAL, Church-street, BIRMINGHAM, 3. HOUSE SURGEON required. Appointment for 6 months, but renewable. Hospital carries resident staff of 5 and provides a 2-year course of instruction. Recognised for the D.O. (England) and F.R.C.S. (England) in Ophthalmology. Wide experience available in all branches, including surgery.

Detailed applications by 30th June to Secretary, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM AND MIDLAND EAR AND THROAT HOSPITAL, Edmund-street, BIRMINGHAM, 3. HOUSE OFFICER required. Pre-registration considered.

Detailed applications, with copies of 2 recent testimonials, to Secretary, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM, 18. DUDLEY ROAD HOSPITAL. (780 Beds.) SENIOR HOUSE OFFICER (obstetrics and gynæcology), resident, required 20th August, 1955. Department of approximately 125 maternity beds, 100 neonatal cots and 60 gynæcological beds, under direction of Senior Consultant Obstetrician.

Applications, with copies of 3 recent testimonials, to Secretary.

BIRMINGHAM, 18. DUDLEY ROAD HOSPITAL. House SURGEON required (pre-registration). Recognised for F.R.C.S. 1 of 3 surgical units of approximately 85 general beds under 2 Consultant Surgeons.

Applications, with copies of 2 recent testimonials, to Secretary.

BIRMINGHAM GROUP 9 HOSPITAL MANAGEMENT COMMITTEE. Whole-time JUNIOR HOSPITAL MEDICAL OFFICERS (2 posts). This Group of nearly 1400 Beds offers much scope for training in modern methods of mental deficiency treatment. Psychological investigation carried out in well-equipped clinical departments. Excellent opportunity for study of young children. Recognised for D.P.M. Married or single accommodation available.

Applications, with names and addresses of 2 referees, to Secretary, Coleshill Hall Hospital, Coleshill, Birmingham, as soon as possible.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(1) **Birmingham (Dudley Road) Hospital Management Committee, Dudley Road Hospital, Birmingham, 18** SURGICAL REGISTRAR for above Hospital (780 Beds). Duties at other Group hospitals as required.

(2) **Birmingham Regional Hospital Board, 10, Augustus-road, Birmingham, 15**

Whole-time ORTHOPÆDIC REGISTRAR for Robert Jones and Agnes Hunt Orthopædic Hospital, Oswestry (459 Beds). Resident or non-resident. Experience specialty and higher qualification in surgery desirable.

Application forms from Group Secretaries, to be returned before 4th July, 1955. Candidates may visit hospitals.

BIRMINGHAM. SOLIHULL HOSPITAL, Lode-lane, SOLIHULL. HOUSE SURGEON (pre-registration post). Post vacant early July. General hospital offering good experience. 5 other resident Medical staff.

Applications, with copies of 2 recent testimonials or names for reference, to Medical Superintendent.

BIRMINGHAM. SOLIHULL HOSPITAL, Lode-lane, SOLIHULL. HOUSE PHYSICIAN (pre-registration post). Post vacant mid-July. General Hospital offering good experience. 5 other resident Medical staff.

Applications, with copies of 2 recent testimonials or names for reference, to Medical Superintendent.

BIRMINGHAM. THE SKIN HOSPITAL, INPATIENTS' DEPARTMENT, George-road, BIRMINGHAM, 15. SENIOR HOUSE OFFICER or HOUSE OFFICER according to experience (required mid-August). Modern well-equipped Inpatients' Department, providing facilities for study of skin diseases. Required to assist Consultant at outpatient clinics.

Applications, with copies of 2 recent testimonials, to Secretary, Dudley Road Hospital, Birmingham, 18.

BIRMINGHAM. THE UNITED BIRMINGHAM HOS-PITALS. THE QUEEN ELIZABETH HOSPITAL. Applications are invited for the post of RESIDENT REGISTRAR in Clinical Pathology (Registrar grade), for duty in the Department of Bacteriology and Clinical Pathology. The post is tenable for 1 year in the first instance.

Forms of application may be obtained from, and should be returned by 25th June, 1955, to, the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Birmingham, 15.

BEXLEY HOSPITAL, Dartford Heath, Bexley, Kent. BEXLEY HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER at above Hospital. Salary £745 p.a., with deductions at £150 p.a. for board, lodging, &c., if resident. The Hospital (2300 Beds) deals with all types of psychiatric illness, and experience in all modern physical, occupational, and psychotherapeutic procedures is available. Opportunities will be available to assist at outpatient clinics.

Applications, with names and addresses of 3 referees, should be sent to the Physician-Superintendent, Dr. L. C. COOK, M.D., D.P.M., within 14 days of the appearance of this advertisement.

BRADFORD A AND B HOSPITAL MANAGEMENT COMMITTEES. JUNIOR HOUSE OFFICER required for newly formed active Geriatric Admission Unit. The major portion of the duties will be carried out at St. Luke's Hospital, Bradford.

Applications, stating age, nationality, qualifications and experience, and copies of testimonials, to the Secretary, Royal Infirmary, Bradford.

BRADFORD ROYAL INFIRMARY. Resident Senior HOUSE OFFICER (medicine and pathology). This is a post of a supervisory nature in 2 acute general medical wards with a Junior House Officer combined with duties in the Department of Pathology consisting of general haematology and post-mortem work. Vacant 23rd June. Salary £745 p.a., less £150 p.a.

Applications, stating age, nationality, qualifications, and experience with copy testimonials, to Secretary.

BRADFORD, YORKSHIRE. THE ROYAL EYE AND EAR HOSPITAL. (105 Beds.) SENIOR HOUSE OFFICER required for E.N.T. Department of 56 Beds. Recognised for D.L.O. and F.R.C.S. Salary £745 p.a., less £150 p.a. residential emoluments.

Applications, stating age, nationality, qualifications and experience, with copy testimonials, to Secretary, Bradford Royal Infirmary.

BRADFORD. ROYAL EYE AND EAR HOSPITAL. HOUSE SURGEON (ophthalmology), vacant 16th July. Recognised for D.O.M.S. and F.R.C.S. Salary according to Whitley Council (MDB) rates.

Applications, stating age, nationality, qualifications, and experience, with copy testimonials, to Secretary, Bradford Royal Infirmary.

BRADFORD. ST. LUKE'S HOSPITAL. (Beds— Maternity 125, Gynæcology 105.) HOUSE OFFICER (obstetrics/gynæcology), vacant 1st August. Recognised for D.Obst.R.C.O.G. and M.R.C.O.G. Salary £425–£525 p.a., less £125 p.a. residential emoluments.

Applications, stating age, nationality, qualifications, and experience, with copy testimonials, to Secretary, Bradford Royal Infirmary.

BRADFORD. ST. LUKE'S HOSPITAL AND WOOD-LANDS HOSPITAL, RAWDON, near LEEDS.

SENIOR HOUSE OFFICER to Orthopædic Unit, with duties at both hospitals, vacant now. Salary £745 p.a., less £150 p.a. residential emoluments.

JUNIOR HOUSE OFFICER to Orthopædic Unit with duties at both hospitals, vacant 1st July. Salary £425–£525 p.a., less £125 p.a. residential emoluments.

Applications, stating age, nationality, qualifications and experience with copy testimonials, to the Secretary, Bradford Royal Infirmary.

BRAINTREE. BLACK NOTLEY HOSPITAL. (544 Beds.) Applications invited for post of SENIOR HOUSE OFFICER for Non-pulmonary Tuberculosis Unit of approximately 120 Beds, particularly for skeletal and renal tuberculosis. Recognised for F.R.C.S.

Applications, with copies of 3 testimonials, to Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

BRIGHTON. ROYAL ALEXANDRA HOSPITAL FOR SICK CHILDREN, Dyke-road. (130 Beds.) HOUSE SURGEON for 6 months from 1st July, 1955. Post offers wide experience in pædiatrics and is recognised for D.C.H.; post is open to pre-registration candidates.

Applications, stating age, nationality, qualifications and experience, together with copies of recent testimonials, to reach the Administrative Officer as soon as possible.

BRIGHTON. SUSSEX EYE HOSPITAL, Eastern-road, BRIGHTON, 7. (56 Beds.) SENIOR HOUSE SURGEON (Senior House Officer) required. Recognised for F.R.C.S. and D.O.

Applications, stating age, qualifications and experience, and naming 2 referees, to the Administrative Officer, Royal Sussex County Hospital, Brighton, 7.

BRISTOL. HAM GREEN HOSPITAL, Pill, near Bristol. HOUSE PHYSICIAN (recognised pre-registration post), vacancy July, 1955.

Apply, Resident Physician.

BRISTOL. HAM GREEN HOSPITAL, Pill, near Bristol. JUNIOR HOUSE OFFICER. Vacancy July, 1955. Recognised pre-registration post. Poliomyelitis Unit and Tuberculosis Meningitis Centre.

Apply, Resident Physician.

BRISTOL. HORTHAM-BRENTRY HOSPITAL MAN-AGEMENT COMMITTEE. DENTAL OFFICER (part-time) required on a sessional basis to serve institutions in this Group situated in Bath, for approximately 1 session of 3½ hours weekly. Salary £150 p.a. per session, plus travelling expenses.

The institutions are as follows :—
House of Help, Walcot-street, Bath (60 patients).
The Old Rectory, Bathwick-hill, Bath (21 patients).
Rock Hall House, Combe Down, Bath (48 patients).

Applications to, and any further information from, Secretary, Hortham-Brentry Hospital Management Committee, Brentry Hospital, Westbury-on-Trym, Bristol.

BRISTOL. HORTHAM-BRENTRY HOSPITAL MAN-AGEMENT COMMITTEE. DENTAL OFFICER (part-time) required on a sessional basis to serve hospitals in this Group situated in or near Bristol, for approximately 3 sessions of 3½ hours weekly. Salary £150 p.a. per session, plus travelling expenses.

The institutions are as follows :—
Hortham Hospital, Almondsbury, near Bristol (700 patients).
Brentry Hospital, Westbury-on-Trym, Bristol (427 patients).
Royal Fort Home, Cotham, Bristol (36 patients).
Chasefield Home, Fishponds, Bristol (31 patients).

Applications to, and any further information from, Secretary Hortham-Brentry Hospital Management Committee, Brentry Hospital, Westbury-on-Trym, Bristol.

BRISTOL-COSSHAM FRENCHAY HOSPITAL MAN-AGEMENT COMMITTEE. FRENCHAY HOSPITAL. (513 staffed beds, expanding.) Applications are invited for the post of SENIOR HOUSE OFFICER in the regional Neurosurgery Department, vacant end of July. This post offers useful surgical experience and the opportunity of gaining a working knowledge of neurological diagnosis.

Applications to the Secretary, Frenchay Hospital, quoting "N.S.F." Names of 2 referees required.

BROMLEY GROUP HOSPITAL MANAGEMENT COM-MITTEE. SENIOR HOUSE OFFICER in Anæsthetics (qualified minimum 1 year) for duty at group hospitals, residing at Bromley Hospital, required immediately for 12 months. Recognised for D.A. and F.F.A.R.C.S. Deduction for residence £150 p.a.

Apply, naming 3 referees, to Administrative Officer, Bromley Hospital, Bromley, Kent.

BROXBURN, WEST LOTHIAN. BANGOUR GENERAL HOSPITAL (near EDINBURGH). Applications are invited for the appointment as REGISTRAR in the Maxillo-facial and Plastic Surgery Unit. Salary and conditions of service in accordance with regulations.

Applications, with full particulars of qualifications and experience, together with names of 3 referees, should reach the Group Medical Superintendent, Bangour General Hospital, Broxburn, West Lothian, within 14 days.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. ROSSENDALE GENERAL HOSPITAL. FAIRFIELD GENERAL HOSPITAL. Applications are invited for the posts of SENIOR HOUSE OFFICER (gynæcology and obstetrics); 1 at each Hospital.

Apply, stating age, qualifications and experience, together with the names of 2 referees, to H. WILKINSON, Group Secretary.

Bury General Hospital, Bury, Lancs.

BOLTON DISTRICT GENERAL HOSPITAL. (Townleys BRANCH PSYCHIATRIC UNIT.) BOLTON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER in Psychiatry (resident). Unit is attached to a General Hospital. Consultant Psychiatrist in charge. All forms of modern treatment in use. Post offers excellent facilities for anyone desiring to specialise in psychiatry and attend D.P.M. course at Manchester University. Hospital also recognised for London and Irish D.P.M. Outpatient clinics in existence. Post now vacant and tenable for 12 months.

Applications, stating age, nationality, qualifications, experience, and the names of 2 referees, to Group Secretary, The Royal Infirmary, Bolton.

BOLTON DISTRICT GENERAL HOSPITAL. (604 Beds, including 109 for obstetrics and 30 for gynæcology.) BOLTON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE OFFICER for the Department of Obstetrics and Gynæcology. Tenable for 6 months, recognised under the Pre-registration Service scheme. Hospital recognised for M.R.C.O.G. and D.Obst.R.C.O.G.

Applications, stating age, nationality, qualifications, experience, and the names of 2 referees, to Group Secretary, The Royal Infirmary, Bolton.

BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of REGISTRAR in Orthopædic Surgery at the Royal Victoria Hospitals, Boscombe, Bournemouth, consisting of 494 Beds, which includes 64 orthopædic beds. There is a large Outpatient Department covering both traumatic and non-traumatic orthopædics in all branches, in children and adults. The post is non-resident and is tenable for 2 years in the first instance.

Forms of application, obtainable from the Group Secretary, Hospital Management Committee Office, Royal Victoria Hospital, Gloucester-road, Boscombe, should be returned to him, duly completed, within 8 days of the appearance of this advertisement.

CAERPHILLY DISTRICT MINERS' HOSPITAL. (6 miles from Cardiff.) RHYMNEY AND SIRHOWY VALLEYS HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (general surgery) required at above Hospital: 144 Beds for general surgery, orthopædics, E.N.T., ophthalmology and gynæcology; 26 Beds for general medicine. Busy Outpatients, Radiology and Pathology Departments. Married quarters available.

Apply, with full particulars, to the Group Secretary, Hospital Management Committee, St. Martin's-road, Caerphilly, Glam.

CAERNARVON AND ANGLESEY HOSPITAL MANAGE-MENT COMMITTEE. Applications are invited for the following posts:—

HOUSE SURGEON—Caernarvon and Anglesey General Hospital, Bangor.

HOUSE SURGEON—Llandudno General Hospital.

The appointments are for a period of 6 months. Salary and conditions of service in accordance with those approved by the Ministry of Health.

Applications, stating age, qualifications and experience, together with the names and addresses of 2 referees, to be forwarded to the Group Secretary, Plas Gwyn, Ffriddoedd-road, Bangor, within 10 days of appearance of this advertisement.

CANTERBURY. KENT AND CANTERBURY HOS-PITAL. (276 Beds.) GYNÆCOLOGICAL HOUSE SURGEON required at Highland Court Annexe, a unit of 25 gynæcological beds situated 3 miles from the above Hospital, with all ancillary services available. Recognised for M.R.C.O.G. 6 months appointment. Post now vacant. National Health Service salary and conditions.

Applications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CANTERBURY. KENT AND CANTERBURY HOS-PITAL. (276 Beds.) E.N.T. AND EYE DEPARTMENTS. SENIOR HOUSE OFFICER. Salary £745 p.a. Post now vacant. Approved for F.R.C.S. and special diplomas.

Applications, together with copies of 2 recent testimonials, to be addressed to the Hospital Secretary at the above Hospital.

CARLISLE. CUMBERLAND INFIRMARY. Applications are invited for 3 HOUSE OFFICER appointments—General Surgery, for the 6 months period commencing 1st August, 1955. The posts are recognised for pre-registration purposes.

Applications, stating age, giving details of education, training and experience, together with the names of 2 referees, should be sent to the Secretary, Cumberland Infirmary, Carlisle, as soon as possible.

CARLISLE. CUMBERLAND INFIRMARY. Applications are invited for the appointment of SENIOR HOUSE OFFICER (general medicine) which will be vacant on 1st August, 1955.

Applications, giving details of age, education, qualifications, and experience, together with the names of 2 referees, should be sent to the Secretary as soon as possible.

CARDIFF HOSPITAL MANAGEMENT COMMITTEE.

(*a*) SENIOR HOUSE OFFICER (non-resident) required immediately in Casualty Department, St. David's Hospital, Cardiff (656 Beds).

(*b*) SENIOR HOUSE OFFICER in Obstetrics and Gynæcology required, commencing 1st August, 1955. Post recognised for M.R.C.O.G.

(*c*) SENIOR HOUSE OFFICER (resident) required at Glan Ely Hospital, Fairwater, Cardiff (240 Beds), for treatment of pulmonary (Thoracic Unit) and all forms of non-pulmonary tuberculosis.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CARDIFF. ROYAL HAMADRYAD GENERAL AND SEAMEN'S HOSPITAL. CARDIFF HOSPITAL MANAGEMENT COMMITTEE. RESIDENT SENIOR HOUSE OFFICER (surgical) required at above Hospital. Post covers 44 Beds—genito-urinary, general surgery, and outpatients. Department under care of Consultants from United Cardiff Hospitals.

Form of application from Group Secretary, 44, Cathedral-road, Cardiff.

CARMARTHEN. WEST WALES GENERAL HOS-PITAL. (188 Beds. Recognised by the Royal College of Surgeons and for Pre-registration Service.) WEST WALES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of Locum Tenens SENIOR HOUSE OFFICER or HOUSE OFFICER (surgical). Senior House Officer salary—£14 10s. per week or House Officer £9 10s. per week (less residential emoluments). Locum required immediately until end of July.

Applications, stating age, qualifications, experience and nationality, with names and addresses of 3 referees, to the Group Secretary, West Wales Hospital Management Committee, Glangwili, Carmarthen.

CHELMSFORD AND ESSEX HOSPITAL. (162 Beds.) Locum Tenens REGISTRAR in Surgery required for the period 5th August–21st August.

Applications to the Secretary, Chelmsford Hospital Management Committee, London-road, Chelmsford.

CHELMSFORD AND ESSEX HOSPITAL. (162 Beds.) Applications are invited for the post of RESIDENT HOUSE SURGEON (pre-registration post). The post will become vacant on 13th July and offers good surgical experience and is recognised for the F.R.C.S.

Applications, together with 2 recent testimonials, to the Secretary, Chelmsford Hospital Management Committee, London-road, Chelmsford.

CHELMSFORD. ST. JOHN'S HOSPITAL. Locum Tenens MEDICAL AND PÆDIATRIC REGISTRAR required as from 20th June, 1955.

Applications to the Secretary, Chelmsford Hospital Management Committee, Chelmsford and Essex Hospital, London-road, Chelmsford.

CHELTENHAM GENERAL AND EYE HOSPITAL. (170 Beds.) HOUSE SURGEON (pre-registration or otherwise) required end June.

Applications, together with the names of 2 referees, to be sent to the Group Secretary, General Hospital, Cheltenham.

CHEPSTOW, MONMOUTHSHIRE. PLASTIC SURGERY JAW INJURIES AND BURNS CENTRE, ST. LAWRENCE HOSPITAL. (100 plastic surgery, 50 orthopædic beds.) SENIOR HOUSE OFFICER in Plastic Surgery required. Previous experience in specialty not essential. The successful candidate will receive a thorough training in plastic surgery and burns. Hospital intakes from most of Wales and provides extensive experience. There is another Senior House Officer in plastic surgery and also a Senior House Officer in orthopædics. Salary £745, less £150 board-residence.

Write, quoting 2 referees, to T. A. JONES, Group Secretary. 64, Cardiff-road, Newport, Mon.

CHICHESTER. GRAYLINGWELL HOSPITAL. Registrar required at the above Psychiatric Hospital which has Departments of Research and Neurology and to which are attached 3 active outpatient clinics. All modern treatments are practised and organised training is given for D.P.M. Furnished accommodation available for single officer. Candidates may visit the Hospital by arrangement with the Medical Superintendent.

Application forms (obtainable from the Group Secretary) are returnable within 14 days of the appearance of this advertisement.

CREWE AND DISTRICT MEMORIAL HOSPITAL. (108 Beds and Annexe 34 Beds—Acute.) SOUTH CHESHIRE HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE OFFICER (surgical) required at the above Hospital (approved for F.R.C.S.). Normally tenable for 6 months. Salary £425–£525, less £125 for residential emoluments.

Apply, stating age, qualifications, experience, &c., with names of 2 referees, to the Group Secretary, Barony Hospital, Nantwich, Cheshire.

CREWE AND DISTRICT MEMORIAL HOSPITAL. (108 Beds and Annexe 34 Beds—Acute.) SOUTH CHESHIRE HOSPITAL MANAGEMENT COMMITTEE. RESIDENT SENIOR HOUSE OFFICER (medical) required. Salary in accordance with Whitley Council scale.

Applications, stating age, qualifications and experience, together with copies of recent testimonials, or the names of 2 referees, to be sent as soon as possible to the Group Secretary, Barony Hospital, Nantwich.

COTTINGHAM. CASTLE HILL SANATORIUM (221 Beds), AND RAYWELL SANATORIUM, near COTTINGHAM (48 Beds). SENIOR HOUSE OFFICER (or LOCUM TENENS) to work under supervision of Consultant Chest Physician in Group Sanatoria with Major Thoracic Surgery Unit and Mass Radiography and laboratory facilities.

Application forms from Group Secretary, Hull B Hospital Management Committee, De la Pole Hospital, Willerby, E. Yorkshire.

COTTINGHAM. CASTLE HILL HOSPITAL. Hull B HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER to work in Major Thoracic Surgery Unit. Residential accommodation available. The Unit has 50 Beds for all types of thoracic surgery, including tuberculous and non-tuberculous, œsophageal, and cardiac.

Applications, with names of referees, to Group Secretary, De la Pole Hospital, Willerby, East Yorkshire.

COLCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for :—

Essex County Hospital, Colchester (188 Beds)
HOUSE PHYSICIAN.
HOUSE OFFICER (surgical).

First, second, third, or pre-registration posts ; tenable for 6 months.

Black Notley Hospital, Braintree, and Essex County Hospital, Colchester

HOUSE SURGEON (first, second, third, or pre-registration post,, tenable for 6 months. Duties to include work in general surgical and gynæcological wards. Recognised for F.R.C.S.

Applications, with copies of 3 testimonials, to Group Secretary, 14, Pope's-lane, Colchester, Essex.

COVENTRY AND WARWICKSHIRE HOSPITAL. (354 Beds.) SENIOR HOUSE OFFICER (casualty—60 Beds), recognised F.R.C.S., vacant 14th August.

Applications to Secretary, Group 20 Hospital Management Committee, Stoney Stanton-road, Coventry.

COVENTRY AND WARWICKSHIRE HOSPITAL. (354 Beds.) SENIOR HOUSE OFFICER in Ophthalmology. Recognised D.O. Good experience in inpatient and outpatient work. Resident.

Applications to Secretary, Group 20 Hospital Management Committee, Stoney Stanton-road, Coventry.

COVENTRY AND WARWICKSHIRE HOSPITAL, (354 Beds.) SENIOR HOUSE OFFICER in Orthopædic Surgery (60 Beds). Resident.

Applications to Secretary, Group 20 Hospital Management Committee, Stoney Stanton-road, Coventry.

DERBY. THE PASTURES HOSPITAL, Mickleover, DERBY. (Hospital for mental and nervous disorders.) DERBY NO. 3 HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER (Male or Female) required. Salary £775 rising by £50 p.a. to £1075. Facilities for obtaining D.P.M. and Membership training are available near to General Hospitals. Large outpatient system. House available to married person, alternatively residential accommodation at a charge of £170 p.a. The Hospital is pleasantly situated about 4 miles from the centre of Derby.

Applications, stating qualifications and experience, and giving the names of 2 referees, to be sent immediately to the Group Secretary.

DOUGLAS. NOBLE'S ISLE OF MAN HOSPITAL. (160 Beds.) Applications are invited for the post of CASUALTY OFFICER with anæsthetic duties. Post offers wide experience in anæsthetics under supervision of Visiting Consultant Anæsthetist. House Officer grade post, recognised for Pre-registration Service, now vacant. 4 residents on staff. Salary £425–£475, with £125 deduction for residential emoluments. Appointment for 6 months.

Applications, enclosing copies of 2 recent testimonials, to the Secretary, Noble's Hospital, Douglas, Isle of Man.

DUDLEY, STOURBRIDGE AND DISTRICT HOSPITAL GROUP, BIRMINGHAM REGION.

The Corbett Hospital, Stourbridge (106 Beds)
SENIOR HOUSE OFFICER (casualty).
HOUSE OFFICER (surgical), pre-registration.

The Guest Hospital, Dudley (154 Beds)
SENIOR HOUSE OFFICER (casualty). Post recognised for F.R.C.S. examination.
HOUSE OFFICER (surgical), pre-registration. Post vacant June.

Wordsley Hospital, near Stourbridge (478 Beds)
SENIOR HOUSE OFFICER (anæsthetics). Resident. Previous experience house appointments essential. Experience available general surgery, gynæcology, orthopædics, plastic surgery unit.
SENIOR HOUSE OFFICER (medical). Post vacant July.
HOUSE OFFICER (surgical) pre-registration.
HOUSE OFFICER (medical), pre-registration. Post vacant June.

Applications, stating age, experience, with copies of 3 recent testimonials, to Group Secretary, The Guest Hospital, Dudley, Worcs.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. (651 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SENIOR REGISTRAR in Anæsthetics. Regional Training scheme includes facilities for gaining experience in specialist techniques at regional centres for plastics, thoracic and neurosurgery. Possession of F.F.A.R.C.S. desirable. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Group Secretary, Hendon Group Hospital Management Committee, Edgware General Hospital, by 29th June, 1955.

EPSOM DISTRICT HOSPITAL, Dorking-road, Epsom, SURREY. EPSOM GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for Whole-time REGISTRAR (general surgery) at above Hospital. Vacancy 1st September, 1955. Recognised for F.R.C.S. Previous surgical experience and higher qualification desirable. Candidates may visit by arrangement with Surgeon-Superintendent.

Forms of application (send stamped addressed foolscap envelope) obtainable from Group Secretary, Epsom District Hospital, for completion and return by 2nd July, 1955.

EPPING. ST. MARGARET'S HOSPITAL. (485 Beds.) RESIDENT SENIOR HOUSE OFFICER (surgery) as Casualty Officer and Orthopædic House Surgeon. Immediate vacancy. Recognised training post for F.R.C.S. Busy general hospital with easy access to London. Salary on national scale, less deduction for board, lodging, &c.

Applications, with copies of 2 recent testimonials, to the Group Secretary, Epping Group Hospital Management Committee, St. Margaret's Hospital, Epping, Essex, immediately.

ENFIELD, MIDDLESEX. CHASE FARM HOSPITAL. ENFIELD GROUP HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE SURGEON (approved pre-registration), vacant 26th July, 1955. Duties with a general Surgical Unit doing some orthopædic work. Post recognised by the Royal College of Surgeons. 6 months appointment.

Applications, with the names and addresses of 2 referees, to the Secretary of the Management Committee.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. REGISTRAR in E.N.T. Surgery, Norfolk and Norwich Hospital and Jenny Lind Children's Hospital, Norwich. Post recognised for D.L.O. and F.R.C.S. Appointment for 1 year, renewable for second year.

Applications, stating age, experience, and names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 27th June, 1955. Candidates invited to visit Hospital by direct arrangement with Hospital Management Committee Secretary, Norfolk and Norwich Hospital.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. SENIOR REGISTRAR in Chest Medicine, Cambridge Area Chest Clinic. The post offers wide experience in all aspects of chest diseases. Higher medical qualification and wide experience in chest diseases and tuberculosis desirable.

Applications, stating age, experience, and names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 4th July, 1955. Candidates invited to visit Clinic by direct arrangement with Consultant Chest Physician, Chest Clinic, Castle Hill, Cambridge.

GLASGOW, N.1. STOBHILL GENERAL HOSPITAL. In the term beginning 1st August, vacancies for HOUSE OFFICERS (pre-registration) exist in the following units]: Medicine (Acute Geriatrics), Gynæcology, Dermatology.

Applications, giving the names of 2 referees, should be addressed to the Medical Superintendent.

GLASGOW, N.1. STOBHILL GENERAL HOSPITAL. PSYCHIATRIC UNIT. HOUSE OFFICERS (resident), Male or Female, required 1st August, 1955. 180 Beds. 1500 admissions yearly, acute treatable cases. Unit recognised for D.P.M.

Apply to Medical Superintendent.

GLOUCESTERSHIRE ROYAL HOSPITAL. Great WESTERN ROAD UNIT. (350 Beds.) Applications are invited for the appointment of SENIOR HOUSE OFFICERS to the Orthopædic and Traumatic Surgery Unit (100 Beds). 2 posts vacant, 1 resident and 1 non-resident. Salary £745 p.a. ; £150 p.a. in respect of residential emoluments is deducted for resident post.

Applications, stating age, nationality, qualifications and experience, should be sent to the Physician-Superintendent, Gloucestershire Royal Hospital, Great Western-road, Gloucester.

GRANTHAM AND KESTEVEN GENERAL HOSPITAL. (117 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT SURGICAL REGISTRAR required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 27th June, 1955, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

GRANTHAM AND KESTEVEN GENERAL HOSPITAL. (117 Beds). RESIDENT HOUSE PHYSICIAN (Senior House Officer or pre-registration intern). General medical and pædiatric. Post vacant 6th August, 1955.

Applications, with full details, and names of 2 referees, to Secretary, 101, Manthorpe-road, Grantham.

GRIMSBY GENERAL HOSPITAL. Grimsby Hospital MANAGEMENT COMMITTEE. Applications are invited for the post, now vacant, of SENIOR HOUSE OFFICER (orthopædic). Locum would be considered.

Applications, with names and addresses of 2 referees, to Hospital Secretary, Grimsby General Hospital.

GRIMSBY GENERAL HOSPITAL. (226 Beds.) Sheffield REGIONAL HOSPITAL BOARD. Whole-time RESIDENT MEDICAL REGISTRAR required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 27th June, 1955, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

HALIFAX. ROYAL HALIFAX INFIRMARY. Senior HOUSE OFFICER in General Surgery required. Post vacant late July.

Applications to be forwarded to the Group Secretary, Royal Halifax Infirmary, Halifax.

HASTINGS. ST. HELEN'S HOSPITAL. (489 Beds.) HOUSE SURGEON required. Resident, pre-registration post, vacant now. Male or Female. National scale of salary.

Apply to Hospital Administrator.

HASTINGS. ROYAL EAST SUSSEX HOSPITAL. (150 Beds.) HOUSE SURGEON required. Pre-registration post. Vacant 26th July. National scale of salary.

Apply to Hospital Administrator.

HULL. KINGSTON GENERAL HOSPITAL. (426 Beds.) HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of HOUSE SURGEON (mainly gynæcological). Pre-registration post. Post now vacant—resident and tenable for 6 months.

Applications, giving full details, and copies of 2 recent testimonials, to the Hospital Secretary.

HULL. KINGSTON GENERAL HOSPITAL. (426 Beds.) HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE SURGEON (recognised for the F.R.C.S. examinations). Pre-registration post. Vacant 1st July and tenable for 6 months.

Applications, giving full details, and copies of 2 recent testimonials, to the Hospital Secretary.

HULL. VICTORIA HOSPITAL FOR SICK CHILDREN, Park-street. HULL A GROUP HOSPITAL MANAGEMENT COMMITTEE. Locum HOUSE SURGEON required, 27th June–10th July, 1955. Duties include ward work, outpatient clinics, and an occasional session in the Casualty Department.

Applications to be sent to the Secretary.

HERTFORD COUNTY HOSPITAL. (171 Beds. Hospital situated 21 miles from London.) Applications are invited for the appointment of HOUSE SURGEON (general—first, second, or third post), to commence 6th July, 1955. Pre-registration post; recognised under F.R.C.S. regulations.

Applications to Group Secretary, Hertford Group Hospital Management Committee, Hertford County Hospital, Hertford, Herts.

HEMEL HEMPSTEAD, HERTFORDSHIRE. WEST HERTS HOSPITAL. CASUALTY OFFICER (Junior Hospital Medical Officer) required. Post vacant now.

Applications, stating 2 names for reference, should be sent to the Hospital Secretary.

HEXHAM GENERAL HOSPITAL, Northumberland. (314 Beds.) Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER in the Orthopædic Department (approximately 110 Beds) at the above Hospital, a hospital recognised by the Royal College of Surgeons.

Applications, giving full details of experience, &c., with the names and addresses of 2 referees, should be sent to the Group Secretary, General Hospital, Hexham, Northumberland, as early as possible and stating whether single or married accommodation is required.

HOUNSLOW GENERAL HOSPITAL. (81 Beds.) Applications are invited for the appointment of RESIDENT CASUALTY OFFICER (Senior House Officer grade), recognised for F.R.C.S. examination. Post vacant 30th August, 1955. Salary £745 p.a., less £150 for residence, &c.

Applications, stating age, qualifications, experience, with copies of 3 recent testimonials or names for reference, to the Hospital Secretary, Hounslow Hospital, Staines-road, Hounslow, Middx.

HOUNSLOW HOSPITAL, Staines-road, Hounslow, MIDDLESEX. (General Acute—81 Beds.) Applications are invited for the appointment of RESIDENT HOUSE PHYSICIAN. Recognised pre-registration appointment for 6 months. Vacant 25th July, 1955.

Applications, stating qualifications and age, with copies of up to 3 recent testimonials or names for reference, to the Hospital Secretary.

HOVE GENERAL HOSPITAL, Sussex. (75 Beds. 3 Resident Medical Officers.) HOUSE SURGEON AND CASUALTY OFFICER (recognised for F.R.C.S.—not pre-registration) required mid-July, 1955. Salary £525, less £125 p.a. for residential emoluments.

Applications, stating age, qualifications, experience, and naming 2 referees, to the Administrative Officer within 7 days of the appearance of this advertisement.

HUDDERSFIELD ROYAL INFIRMARY. (312 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required to commence duty immediately. The post is recognised as a pre-registration appointment and for the F.R.C.S. Salary in accordance with national scale.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Secretary to the Management Committee.

The Royal Infirmary, Huddersfield.

IPSWICH. EAST SUFFOLK AND IPSWICH HOSPITAL. (356 Beds.) Applications are invited for the post of CASUALTY OFFICER (Senior House Officer grade). The post is recognised for the F.R.C.S. examination.

Applications, stating age and nationality, together with copies of recent testimonials, to Hospital Secretary.

IPSWICH. ST. HELEN'S HOSPITAL. (100 Beds for infectious diseases, pulmonary tuberculosis and long-stay orthopædics. The Area Chest Clinic is in the Hospital.) HOUSE PHYSICIAN required (post-registration appointment). Accommodation available for married man.

Applications to JOHN WILLIAMS, Group Secretary, Ipswich Group Hospital Management Committee, at the East Suffolk and Ipswich Hospital, Ipswich.

KINGSTON HOSPITAL, Wolverton-avenue, Kingston-ON-THAMES. KINGSTON GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following Pre-registration HOUSE OFFICER posts which become vacant on 1st August, 1955.

1 in General Medicine.

2 in General Surgery.

Applications, stating age, qualifications, experience and copies of 2 recent testimonials, to reach the Physician-Superintendent of the Hospital by 25th June.

LEICESTER ROYAL INFIRMARY. Locum Senior HOUSE OFFICER (obstetrics and gynæcology) required for 3rd–17th July inclusive. Senior Registrar on establishment.

Apply Secretary.

LEICESTER ROYAL INFIRMARY. Locum Senior HOUSE OFFICER (pædiatrics) required for 27th June–10th July, inclusive.

Apply Secretary.

LEIGH INFIRMARY, Leigh, Lancashire. House Surgeon (pre-registration post).

Applications to Secretary, Wigan and Leigh Hospital Management Committee, Knowsley House, Wigan.

LOUTH. COUNTY INFIRMARY. (215 Beds.) Grimsby HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post, now vacant, of SENIOR HOUSE OFFICER (orthopædic and casualty).

Applications, stating age and experience, together with names of 2 referees, to the Hospital Secretary.

LEWES (near). CHAILEY HERITAGE (Croft School AND HOSPITAL), NORTH CHAILEY, near LEWES, SUSSEX. MID-SUSSEX HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER required for 300-Bed Children's Orthopædic Unit with orthopædic clinics. Good experience for long-term orthopædic and pædiatric work. 1 years previous house appointment essential. Post vacant end of July. Salary under National Health Service regulations.

Applications, with 2 referees' names, should be forwarded to the Medical Administrator.

LEEDS REGIONAL HOSPITAL BOARD. Medical Act, 1950. RESIDENT HOUSE OFFICER posts. Recognised pre-registration house posts will be available for the 6 months commencing 1st August, 1955, in the following hospitals approved under the Medical Act, 1950. Certain posts marked * are vacant now, and applications will be accepted immediately.

Scarborough Hospital (191 Beds)
1 Surgical (general surgery, E.N.T., and orthopædic).
1 Surgical (midwifery and ophthalmology).

City Hospital, York (265 Beds)
1 General Surgical (recognised for F.R.C.S.).

County Hospital, York (222 Beds)
1 General Surgical (recognised for F.R.C.S.).

Hull Royal Infirmary and Sutton (250 Beds)
1 General Surgical (recognised for F.R.C.S.).
1 Surgical (orthopædic).

Western General Hospital, Hull (543 Beds)
1 Medical.
1 Surgical (general surgery and radiotherapy).
1 Surgical (gynæcology).

Kingston General Hospital, Hull (398 Beds)
1 Medical.
1 General Surgical.

Westwood Hospital, Beverley (202 Beds)
1 General Surgical.
1 Surgical (orthopædic).

Recognised for F.R.C.S.

East Riding Hospital, Driffield (249 Beds)
1 Medical (general medical and pædiatric).
1 Surgical (general surgery, gynæcology, and E.N.T.). Recognised for F.R.C.S.

Pontefract General Infirmary (89 Beds)
1 Medical (general medical and pædiatric).
1 General Surgical (recognised for F.R.C.S.).

Clayton Hospital, Wakefield (200 Beds)
1 Surgical (general surgery and gynæcology). Recognised for F.R.C.S.

General Hospital, Wakefield (158 Beds)
1 Medical (general medical and geriatrics).

Seacroft Hospital, Leeds (60 Child Surgery Beds)
1 Surgical (child general surgery, E.N.T., and ophthalmology).

Pinderfields Hospital, Wakefield (663 Beds)
1 Surgical (orthopædic).
1 Surgical (thoracic).

General Hospital, Batley (102 Beds)
1 Surgical (general surgery and E.N.T.).*
1 Surgical (orthopædic and ophthalmology).*

Staincliffe General, Dewsbury (311 Beds)
1 Medical (general medical and dermatology).
1 Medical (general medical and pædiatric).

Huddersfield Royal Infirmary (304 Beds)
1 Medical (general medical and pædiatric).
1 Surgical (general surgery and orthopædic). Recognised for F.R.C.S.

Royal Halifax Infirmary (301 Beds)
1 General Surgical * (recognised for F.R.C.S.).

Halifax General Hospital (425 Beds)
1 Medical (pædiatric).*
2 General Surgical (recognised for F.R.C.S.).

Bradford Royal Infirmary (507 Beds)
1 Medical.
1 General Surgical.
2 Surgical (casualty and orthopædic).*

Recognised for F.R.C.S.

St. Luke's Hospital, Bradford (828 Beds)
2 Medical.
1 Medical (general medical and dermatology).
1 General Surgical.
1 Surgical (general surgery and plastic).*
2 Surgical (orthopædic and casualty).*

All surgical posts recognised for F.R.C.S.

Keighley Victoria Hospital (144 Beds)
1 Surgical (general surgery, orthopædic, and E.N.T.). Recognised for F.R.C.S.

General Hospital, Otley (170 Beds)
1 Surgical (general surgery and orthopædics).

St. James's Hospital, Leeds (1539 Beds)
1 Surgical (gynæcology). Recognised by R.C.O.G.

Harrogate General Hospital (249 Beds)
2 Medical.
1 Surgical (recognised for F.R.C.S.).

Candidates should express, where applicable, their preference for medical, surgical or midwifery posts within the same hospital on the application form.

Candidates wishing to apply for posts at more than 1 hospital should complete a separate form in respect of each hospital.

Application forms can be obtained from the Senior Administrative Medical Officer, Leeds Regional Hospital Board, Park-parade, Harrogate, or from the Dean, School of Medicine, Thoresby-place, Leeds, 2, and should be returned to either of the above-named as soon as possible. Application may be made in advance of results of final examination.

LEEDS REGIONAL HOSPITAL BOARD. Registrar vacancies.

Anæsthetics

(*a*) Huddersfield Group (approximately 225 Beds in the surgical specialties) (resident or non-resident).

(*b*) Bradford A and B Groups (preferably resident). Recognised for the F.F.A. R.C.S. Approximately 700 Beds in the surgical specialties. Establishment 1 Senior Registrar and 2 Registrars.

Obstetrics and Gynæcology

Duties at Halifax General Hospital with additional duties at the Royal Halifax Infirmary (130 obstetric and 50 gynæcological beds). Recognised for M.R.C.O.G. (resident).

Plastic Surgery

St. James's Hospital, Leeds (non-resident). Special Plastic and Maxillo-facial Unit (72 Beds).

Psychiatry

Broadgate Hospital, Beverley (600 Beds). Accommodation for single person (resident/non-resident). If desired facilities for attendance at the Leeds University will be provided if the successful candidate is studying for the D.P.M.

Applications, stating age, qualifications and details of appointments held showing dates, with names and addresses of 3 referees to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 30th June, 1955.

LEEDS, 9. ST. JAMES'S HOSPITAL. Leeds A Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners (Male and Female) for the appointment of SENIOR HOUSE OFFICER (orthopædics). The appointment, which is recognised by the Royal College of Surgeons for Fellowship, will be for a period of 1 year and the salary will be in accordance with the agreed terms and conditions of service of hospital medical and dental staffs, namely, £745 p.a. with an appropriate deduction in respect of board, lodgings, and other services provided.

Applications, stating age, qualifications, experience, &c., together with the names of 2 referees, to be forwarded to the undersigned as soon as possible.

J. FOLKARD, Secretary to the Committee.

Administrative Offices, St. James's Hospital, Leeds, 9.

LEAMINGTON SPA. WARNEFORD GENERAL HOSPITAL. (207 Beds.) Applications are invited for HOUSE OFFICER (anæsthetics). The post is recognised for D.A.

Applications to Hospital Secretary.

LEAMINGTON SPA. WARNEFORD GENERAL HOSPITAL. (207 Beds.) CASUALTY OFFICER (Senior House Officer), Male or Female, resident or non-resident. Post vacant and suitable for one reading for higher qualifications, being recognised for F.R.C.S., affording contact with all Specialist Units in the Hospital.

Applications, together with 3 references, to Hospital Secretary.

LINCOLN. ST. GEORGE'S HOSPITAL. Lincoln No. 1 HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER at the above Hospital. Duties include assisting in the care of medical, surgical, and geriatric patients. Married accommodation is available.

Applications, giving full particulars together with 3 names for reference, should be addressed to—

R. W. HOWICK, Group Secretary.

County Hospital, Lincoln.

LIVERPOOL. RATHBONE HOSPITAL, Mill-lane, LIVERPOOL, 13. Applications are invited for the post of SENIOR HOUSE OFFICER. The Hospital has 144 Beds and admits the usual infectious diseases. Facilities might be given to the applicant appointed to attend the D.P.H or similar course at Liverpool University. Salary £745 p.a., less £130 p.a. in respect of residential emoluments.

Applications, on forms obtainable from the undersigned, to be returned completed forthwith.

H. BLYTHE, Group Secretary.

Broadgreen Hospital, Liverpool, 14.

LOWESTOFT AND NORTH SUFFOLK HOSPITAL, LOWESTOFT. (98 Beds.) HOUSE PHYSICIAN (Male or Female) required on or about 15th July, 1955. The post is recognised for Pre-registration Service and the Hospital is regularly visited by Consultant staff from the Norfolk and Norwich Hospital. Salary £425, £475, or £525 p.a., according to experience, less £125 for residence. Alternatively, as SENIOR HOUSE PHYSICIAN, salary £745 p.a., less £150 for residence. Membership of a Medical Defence Society is a condition of appointment.

Applications, stating age, qualifications and experience, with names and addresses of 2 referees, to Hospital Secretary.

LUTON AND DUNSTABLE HOSPITAL, Luton, Bedfordshire. Applications are invited for the post of SENIOR HOUSE OFFICER for Accident Service, including duties in the Hand Infection Unit. Vacant 1st August, 1955, and tenable for 1 year. Post recognised for F.R.C.S.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent to the Secretary by 21st June, 1955.

LUTON AND DUNSTABLE HOSPITAL, Luton, Bedfordshire. Applications are invited for the post of OBSTETRIC AND GYNÆCOLOGICAL HOUSE SURGEON, vacant 1st July, 1955, and tenable for 6 months. Recognised as pre-registration midwifery post.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent to the Secretary by 21st June, 1955.

LUTON AND DUNSTABLE HOSPITAL, Luton, Bedfordshire. Applications are invited for 2 posts of HOUSE SURGEON, vacant 1st July, 1955, and tenable for 6 months. Recognised as pre-registration posts and for F.R.C.S.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent to the Secretary by 21st June, 1955.

LUTON AND DUNSTABLE HOSPITAL, Luton, Bedfordshire. Applications are invited for 2 posts of HOUSE SURGEON for Accident Service including Orthopædic Department, vacant 1st July, 1955, and tenable for 6 months. Recognised as pre-registration posts and F.R.C.S.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent to the Secretary by 21st June, 1955.

LUTON MATERNITY HOSPITAL, Luton, Bedfordshire. RESIDENT OBSTETRIC HOUSE SURGEON required 1st July, 1955. The post, which is for 6 months in the first instance, is recognised for the D.Obst.R.C.O.G.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent by 21st June to the Secretary, Luton and Hitchin Group Hospital Management Committee, St. Mary's Hospital, Luton, Beds.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following pre-registration posts :—

(*a*) HOUSE SURGEON.

(*b*) HOUSE PHYSICIAN.

6 months appointments. Posts vacant July, 1955. Salary at the rate of £425, £475, or £525 according to experience. A deduction at the rate of £125 a year is made in respect of board and lodging and other services provided.

Applications should be forwarded as soon as possible to the Administrative Officer at the Hospital.

MAIDENHEAD HOSPITAL, St. Luke's-road, Maidenhead. RESIDENT SURGICAL REGISTRAR required. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, Windsor Group Hospital Management Committee, Almaroad, Windsor, by 30th June.

MAIDENHEAD HOSPITAL, St. Luke's-road, Maidenhead. Applications invited for post of HOUSE SURGEON vacant 14th July. Preference given to persons seeking pre-registration post.

Applications, stating age, nationality and qualifications, with names of 3 referees, to Hospital Secretary.

MANCHESTER REGIONAL HOSPITAL BOARD. Applications are invited for the whole-time post of REGISTRAR in Chest Diseases in the Ashton, Hyde and Glossop Group and Oldham and District Group of hospitals. The post offers wide experience in both outpatient clinics and pulmonary hospitals.

Applications to the Group Secretary, Ashton, Hyde and Glossop Hospital Management Committee, Ashton-under-Lyne General Hospital, Ashton-under-Lyne, Lancs.

MANCHESTER REGIONAL HOSPITAL BOARD. Blackburn AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. RESIDENT REGISTRAR (obstetrics/gynæcology) required. Post recognised for M.R.C.O.G. Based on Queen's Park Hospital, Blackburn (a general hospital with 83 obstetrical/gynæcological beds), with duties at Blackburn Royal Infirmary and Accrington Victoria Hospital. Accommodation for married man and small family available if required.

Application forms obtainable from, and returnable to, the Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of RESIDENT REGISTRAR in Obstetrics and Gynæcology, 1 of 2, in the West Manchester Group of Hospitals with main duties at Park Hospital, Davyhulme. There are 73 obstetric beds, 31 gynæcology beds and a special care Baby Unit of 7 Beds at Park Hospital. Vacant 26th June, 1955. Appointment for 1 year, renewable.

Application forms from Secretary, Park Hospital, Davyhulme.

MANCHESTER REGIONAL HOSPITAL BOARD. Senior REGISTRAR in Radiotherapy at the Christie Hospital and Holt Radium Institute, Manchester. D.M.R.T. essential and F.F.R. desirable.

Application forms, obtainable from the Senior Administrative Medical Officer, Cheetwood-road, Manchester, 8, should be returned by 27th June, 1955.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS, MANCHESTER. Applications are invited from registered medical practitioners (Male or Female) for 2 posts of HOUSE PHYSICIAN in the Neonatal Unit of Saint Mary's Hospitals (attached to the University Department of Child Health) for a period of 6 months, vacant on 22nd July and 1st August, 1955. Previous hospital experience essential and pædiatric experience desirable. Duties include the care of the newborn in the Maternity Department, the care of infants in the infants ward and work in the clinics under the charge of the Department of Child Health. Salary in accordance with national scale.

Applications, stating qualifications and experience, together with the names of 3 referees, should be sent to the undersigned not later than 27th June, 1955.

A. R. WISE, General Superintendent.

Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS. Applications are invited for the post of SENIOR HOUSE OFFICER in Obstetrics. Applicants must have had previous hospital experience in general medicine and surgery, and in obstetrics. The post is recognised for purposes of the M.R.C.O.G. examination. The duties involve clinical responsibility for mothers and babies, and supervision of the work of pre-registration House Officers is also included. The appointment is for 12 months from 1st September, 1955. National scale.

Application forms may be obtained from the undersigned and returned not later than 2nd July, 1955.

A. R. WISE, General Superintendent.

Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. PARK HOSPITAL, DAVYHULME. (General Hospital—433 Beds.) SENIOR HOUSE OFFICER (anæsthetics) required. Post now vacant. Hospital recognised for training for Diploma in Anæsthetics.
▶ Forms from Secretary.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. PARK HOSPITAL, DAVYHULME. (General Hospital—433 Beds.) RESIDENT SENIOR HOUSE OFFICER (pathology) required for 1 year for post now vacant in the Group Laboratory. Previous experience not essential. Facilities for training in all branches. Laboratory recognised for D.C.P. and D.Path. examinations.
Forms from Secretary.

MANCHESTER, 20. WITHINGTON HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT CLINICAL PATHOLOGIST (Senior House Officer grade), which will be vacant on 14th August. Previous experience in pathology not essential, the post affording opportunities for gaining experience in all branches of clinical pathology.
Applications, stating age, qualifications, present post, experience and names of 2 referees, to be forwarded immediately to—
A. H. KEATES, Group Secretary.

MANCHESTER, 20. WITHINGTON HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (medical) required at the above Hospital. Post now vacant.
Applications, stating age, qualifications, present post, experience, and names of 2 referees, to be sent to the Group Secretary, Withington Hospital, immediately.

MID-GLAMORGAN HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the following medical staff appointments vacant on the dates stated :—

Neath General Hospital (412 Beds)
HOUSE SURGEON—1st August, 1955.
HOUSE SURGEON—15th August, 1955.
HOUSE PHYSICIANS—1st August, 1955.

Bridgend General Hospital (381 Beds)
HOUSE SURGEONS—1st August, 1955.
HOUSE PHYSICIAN—1st August, 1955.
SENIOR HOUSE OFFICER (anæsthetics)—immediately.
RESIDENT OFFICER (surgical), Senior House Officer grade—1st August, 1955.

Port Talbot General Hospital (85 Beds)
SENIOR HOUSE OFFICER (general medicine)—immediately.

Tonna Children's Hospital
SENIOR HOUSE OFFICER (pædiatrics, E.N.T., ophthalmology, orthopædic and traumatic)—1st August, 1955.

Applications, naming 2 referees, to be addressed to the Group Secretary, 8, Wind-street, Neath.

MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of RESIDENT ANÆSTHETIST for joint duties at the West Kent General Hospital, and the Kent County Ophthalmic and Aural Hospital, Maidstone (total beds 254). The post, which is of Senior House Officer grade, will be vacant on 1st July, 1955, and carries a salary of £745 a year, less £150 for residential emoluments. Excellent experience under Consultant Anæsthetists is available, and the post is recognised for the F.F.A.R.C.S. examination.
Applications, stating age, nationality, qualifications, and experience, together with the names of 2 suitable referees, should be forwarded to the Administrative Officer, West Kent General Hospital, Maidstone.

NEWCASTLE GENERAL HOSPITAL. (838 Beds.) NEWCASTLE UPON TYNE HOSPITAL MANAGEMENT COMMITTEE. RESIDENT CASUALTY OFFICER required for the Casualty Department (Junior Hospital Medical Officer grade). Salary £775–£1075 p.a. The post provides excellent postgraduate training for future general practice and other branches of medicine. The post may be tenable for 3 or 4 years with a possibility of extension in exceptional circumstances.
Applications should be addressed to the Secretary, Newcastle General Hospital, Westgate-road, Newcastle upon Tyne, 4, together with 1 copy of 2 recent testimonials.

NEWCASTLE GENERAL HOSPITAL. (838 Beds.) NEWCASTLE UPON TYNE HOSPITAL MANAGEMENT COMMITTEE. DEPARTMENT OF NEUROLOGICAL SURGERY. SENIOR HOUSE OFFICER (resident or non-resident). The post affords excellent experience in neurology and would be of value to candidates preparing for a higher qualification. No surgical work is involved, the duties being purely medical and no previous neurosurgical experience is required. The appointment is tenable for 12 months in the first instance.
Applications should be addressed to the Secretary, Newcastle General Hospital, Westgate-road, Newcastle upon Tyne, 4, together with 1 copy of 2 recent testimonials.

NEWCASTLE GENERAL HOSPITAL. Newcastle upon TYNE HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the resident post of HOUSE PHYSICIAN to the Professorial Psychiatric Unit in the above Hospital in association with ward accommodation at St. Mary's Hospital, Stannington. (Accommodation for single person or married couple only.) This post is recognised for the purpose of Pre-registration Service and preference will be given to provisionally registered persons who have carried out their first House appointment. The Unit is under the clinical direction of the Department of Psychological Medicine, King's College Medical School, University of Durham. Salary according to terms and conditions of service, issued by the Ministry of Health. The Hospital is recognised for the purpose of study for the Diploma in Psychological Medicine.
Applications, together with 1 copy of 2 testimonials, should be sent within 10 days of the appearance of the advertisement to the Secretary, Newcastle General Hospital, Westgate-road, Newcastle upon Tyne, 4.

NEWCASTLE UPON TYNE HOSPITAL MANAGEMENT COMMITTEE AND HEXHAM AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE, NORTHUMBERLAND. DEPARTMENTS OF OBSTETRICS AND GYNÆCOLOGY. Applications are invited for the following posts vacant on 7th July, 1955 :—

(1) **Newcastle General Hospital** (838 Beds)
(*a*) Department of Obstetrics (70 Beds) : HOUSE SURGEON (resident), pre-registration.
(*b*) Department of Gynæcology (30 Beds) : HOUSE SURGEON (resident), pre-registration.
This department is recognised for the M.R.C.O.G. and D.Obst.R.C.O.G., and undertakes the training of medical students in the University of Durham. Preference will be given to provisionally registered candidates who have carried out their first house appointment. Consideration may be given to the possibility of alternating these posts.

(2) **Hexham General Hospital** (314 Beds)
Gynæcology : HOUSE SURGEON (resident), pre-registration. Recognised for M.R.C.O.G. Applications considered from final year students in anticipation of graduation.

(3) **Dilston Hall Maternity Hospital, Corbridge** (50 Beds)
Obstetrics : HOUSE SURGEON (resident), pre-registration. Recognised for D.Obst.R.C.O.G.

Applications, together with 1 copy of 2 recent testimonials, should be sent to the Secretary, Newcastle General Hospital, Westgate-road, Newcastle upon Tyne, by 25th June, 1955.

NEWMARKET GENERAL HOSPITAL, Newmarket. Applications are invited for the post of HOUSE PHYSICIAN, vacant 29th July, 1955. Duties include house charge of general medical and pulmonary tuberculosis beds. The post is recognised for pre-registration, is resident and tenable for 6 months. Salary in accordance with national scale.
Applications, together with 3 recent testimonials, to Physician-Superintendent.

NEWMARKET GENERAL HOSPITAL, Newmarket. Applications are invited for the post of SENIOR HOUSE OFFICER (obstetrics, 14 Beds, and gynæcology, 10 Beds), with opportunity for gaining experience in general surgery, required on 8th July, 1955. Salary £745, less emoluments.
Applications, giving age, nationality, and qualifications, together with copies of 3 recent testimonials, to be addressed to the Physician-Superintendent.

NEWMARKET GENERAL HOSPITAL, Newmarket. Applications are invited for the post of HOUSE SURGEON vacant 9th July, 1955. Duties include surgical house charge of general surgical, E.N.T., and eye cases. Post resident and available for 6 months, recognised for pre-registration.
Applications, with copies of 3 testimonials, to the Physician-Superintendent.

NEWPORT, I.W. ST. MARY'S HOSPITAL. (350 Beds.) SENIOR HOUSE OFFICER required as Casualty Officer (recognised for F.R.C.S.) and as House Officer to Consultant Obstetrician and Gynæcologist. Vacant 13th August. Salary £745, less residential charge. Modern flat available for married candidate.
Applications, with names of 2 referees, to Hospital Secretary.

NOTTINGHAM AND MIDLAND EYE INFIRMARY. Required, 2 SENIOR HOUSE OFFICERS, duties to commence on 30th June and 31st July. Salary and conditions of service in accordance with Ministry regulations.
Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to the Group Secretary, General Hospital, Nottingham.

NOTTINGHAM. HIGHBURY HOSPITAL. Applications are invited from fully qualified medical practitioners for the post of SENIOR HOUSE OFFICER in the Obstetrical and Gynæcological Department (42 obstetrical beds, 11 gynæcological beds, and a small block for puerperal pyrexia). The appointment is for a period of 12 months to commence 14th July. The Hospital is recognised for the M.R.C.O.G. (obstetrics only). Previous obstetric experience required.
Applications, stating age, qualifications, and experience, also nationality, together with copies of recent testimonials, to be sent to the Group Secretary, General Hospital, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Hogarth Radio-THERAPY CENTRE. A vacancy exists at the above Centre for a SENIOR HOUSE OFFICER in Radiotherapy or REGISTRAR (if in possession of Part I, D.M.R.T.) in Radiotherapy. The Centre is recognised as a Training School for both Part I and II D.M.R.T. (Royal Colleges of London) in conjunction with the University of Nottingham, and instruction for this examination can be given to those interested and suitable. The position offers excellent experience for persons studying for other post-graduate degrees.
Apply as soon as possible, stating age, qualifications and experience, together with names of 3 referees, to the Group Secretary, General Hospital, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited for the post of RESIDENT SENIOR ANÆSTHETIC HOUSE OFFICER, vacant 28th June. The post is recognised for the D.A. and the F.F.A. R.C.S. This is a busy general hospital, giving experience in all branches of surgery.
Applications, stating age, nationality and qualifications, together with copies of testimonials, to be sent to the Group Secretary.

NOTTINGHAM GENERAL HOSPITAL. E.N.T. Depart-MENT. Applications are invited for the post of SENIOR E.N.T. HOUSE OFFICER for the above Hospital. This appointment is recognised for the D.L.O. and the F.R.C.S. examinations. Salary and conditions of service in accordance with Ministry regulations. Duties to commence as soon as possible. Although the post is normally resident, consideration will be given to any applicant who desires to live out.
Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to the Group Secretary, General Hospital, Nottingham.

NOTTINGHAM GENERAL HOSPITAL. Applications are invited for the post of CLINICAL PATHOLOGIST (Senior House Officer grade), resident or non-resident, duties to commence as soon as possible. Previous experience in pathology not essential. Opportunities for training in all branches of clinical pathology are afforded in a department serving over 1200 beds. Salary and conditions of service in accordance with Ministry Regulations.

Applications, stating names and addresses of 3 referees, to be received within 2 weeks of this advertisement, addressed to—
HENRY M. STANLEY, Group Secretary.

NOTTINGHAM GENERAL HOSPITAL. Resident House SURGEONS (pre-registration first or second post) required for 19th June and 28th June for 6 months. Recognised for F.R.C.S.

Applications, stating age, qualifications and experience, together with copies of testimonials, to be sent to Group Secretary.

OLDHAM ROYAL INFIRMARY. (190 Beds.) Applications are invited for the appointment of RESIDENT CLINICAL PATHOLOGIST (Senior House Officer), vacant immediately. The duties will consist mainly of clinical pathology, but include P.H. bacteriology and V.D. serology; also general and emergency work, and supervision of the blood banks. Previous experience in pathology is not essential.

Applications, stating age, nationality, qualifications and experience, together with the names of 2 referees, and quoting Ref. No. D/130.

ORPINGTON HOSPITAL, Orpington, Kent. Resident ANÆSTHETIST (Senior House Officer) required for above 813-Bedded General Hospital. Post recognised for D.A.

Apply Physician-Superintendent.

PAISLEY AND DISTRICT HOSPITALS MATERNITY UNIT. Locum JUNIOR HOSPITAL MEDICAL OFFICER required for above Unit.

Applications to Group Medical Superintendent, Royal Alexandra Infirmary, Paisley.

PAISLEY AND DISTRICT HOSPITALS BOARD OF MANAGEMENT. The following posts are available, duties commencing 1st August, 1955 :—

(1) JUNIOR HOSPITAL MEDICAL OFFICERS for :—
(*a*) Orthopædic Unit and
(*b*) Casualty Department
for Royal Alexandra Infirmary.
(2) HOUSE OFFICERS for :—
(*a*) Paisley Maternity Unit and
(*b*) Paisley I.D. Hospital.

Applications to Group Medical Superintendent, Royal Alexandra Infirmary, Paisley.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL.

SENIOR HOUSE OFFICER in Surgery, Greenbank Road Section, vacant 1st August, 1955. Recognised for the F.R.C.S.

SENIOR HOUSE OFFICER in Surgery, Devonport Section, vacant 21st August, 1955. Recognised for the F.R.C.S.

SENIOR HOUSE OFFICER to Casualty and Traumatic Department, Freedom Fields Section, vacant 3rd August, 1955.

HOUSE SURGEON (pre-registration post), Freedom Fields Section, vacant 1st July, 1955. Recognised for the F.R.C.S.

Applications, stating age, nationality, qualifications and experience, with names of 3 referees, to be sent to—
ARTHUR R. CASH, Group Secretary, Plymouth.
South Devon and East Cornwall General Hospital Group.
7, Nelson-gardens, Stoke, Plymouth.

PLYMOUTH, SOUTH DEVON AND EAST CORNWALL GENERAL HOSPITAL GROUP.

Alexandra Maternity Home, Devonport

HOUSE OFFICER in Obstetrics, vacant immediately.

Applications, stating age, nationality, qualifications and experience, with names of 3 referees, to be sent to the undersigned as soon as possible.

ARTHUR R. CASH, Group Secretary.
7, Nelson-gardens, Stoke, Plymouth.

PONTYPRIDD AND RHONDDA HOSPITAL MANAGEMENT COMMITTEE. LLWYNYPIA HOSPITAL, LLWYNYPIA, RHONDDA. (50 acute medical beds; geriatric beds; serving area population of 112,000.) SENIOR HOUSE OFFICER (medical), to commence 1st August, 1955. Person appointed will have part responsibility for the Group Infectious Diseases Hospital.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be sent to the Group Secretary, Courthouse-street, Pontypridd.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE.

Saint Mary's Hospital

SENIOR HOUSE OFFICER for Pædiatric Department (53 Beds), including over-sight of neonatal problems in a large Maternity Department. Vacant 21st July, 1955.

Queen Alexandra Hospital

SENIOR HOUSE OFFICER required for the Gynæcological Department of the Group for duties at the above Hospital. 40 gynæcological beds. Recognised for M.R.C.O.G. Vacant now.

Applications, stating age, experience, and qualifications, together with names of 2 referees, should be forwarded as soon as possible to L. C. ROGERS.
35, Grove-road South, Southsea.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of RESIDENT SURGICAL OFFICER (Registrar grade), with duties mainly at the Royal Portsmouth Hospital. Recognised for the F.R.C.S.

Forms of application may be obtained from the Acting Group Secretary, 35, Grove-road South, Southsea, which should be returned to him duly completed on or before 27th June, 1955. Candidates may visit the above Hospital by arrangement with the Acting Group Secretary.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE.

Royal Portsmouth Hospital

HOUSE OFFICER for pædiatric and medical beds—total 30. Pre-registration post. Vacant 16th July, 1955.

St. Mary's Hospital (74 medical and 107 surgical beds)

HOUSE PHYSICIAN, vacant 31st July. Pre-registration post.

HOUSE SURGEON, vacant 25th July. Pre-registration post.

HOUSE SURGEON, vacant 26th July. Pre-registration post.

HOUSE SURGEON, vacant 31st July. Pre-registration post.

Applications, stating age, experience and qualifications, together with names of 2 referees, should be forwarded as soon as possible to L. C. ROGERS.
35, Grove-road South, Southsea.

POOLE GENERAL HOSPITAL, Poole, Dorset. (320 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. HOUSE PHYSICIAN (pre-registration) required. Post becoming vacant on 18th July, 1955.

Applications to the Hospital Secretary.

POOLE GENERAL HOSPITAL, Poole, Dorset. (320 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. RESIDENT OBSTETRIC OFFICER (Senior House Officer) required. Post becoming vacant on 8th August, 1955. Hospital recognised for D.Obst.R.C.O.G.

Applications to the Hospital Secretary.

READING. ROYAL BERKSHIRE HOSPITAL. (401 Beds.) Applications are invited from registered medical practitioners only for the resident post of JUNIOR HOUSE SURGEON (gynæcology), vacant immediately and tenable for 6 months.

Write, stating age, qualifications with dates, nationality, present post, with copy of 1 recent testimonial, to the Secretary.

READING. ROYAL BERKSHIRE HOSPITAL. (401 Beds.) Applications are invited from registered medical practitioners for the appointment of SENIOR RESIDENT ANÆSTHETIST, vacant 20th July, for period of 1 year. F.F.A.R.C.S. recognised. Salary £745 p.a., less £125 p.a. board-residence.

Write, stating age, qualifications with dates, nationality and present post, with copy of 1 recent testimonial, to Secretary.

RHYMNEY AND SIRHOWY VALLEYS HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICERS (pre-registration posts if suitable candidates available) required in July at :—
CAERPHILLY AND DISTRICT HOSPITAL (near Cardiff); Surgical Department.
TREDEGAR HOSPITAL (near Newport, Mon., and Cardiff); Surgical Unit of 50 Beds. Married quarters available.

Salary £425–£525, according to experience, less appropriate deductions for emoluments.

Apply, with full particulars, to Group Secretary, Hospital Management Committee, St. Martin's-road, Caerphilly.

ROTHERHAM. MOORGATE GENERAL HOSPITAL. (355 Beds.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT REGISTRAR (obstetrics and gynæcology) required. Post becomes vacant 13th August. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 27th June, 1955, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) SENIOR HOUSE OFFICER (resident) required from 1st August, 1955, for duties in the Casualty and Admissions Department. This is a large general hospital with specialised departments dealing with all types of acute medical and surgical cases. The post affords good opportunity for gaining tuition and experience.

Applications should be addressed to Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford, as soon as possible.

ROMFORD, ESSEX. VICTORIA HOSPITAL. (99 Beds.) RESIDENT HOUSE SURGEON (Male) required. (Post not approved for pre-registration purposes.)

Applications should be forwarded immediately to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

RUGBY. HOSPITAL OF ST. CROSS. (156 Beds.) CASUALTY AND ACCIDENT OFFICER (Junior Hospital Medical Officer status), resident, married quarters available, recognised F.R.C.S. Duties include orthopædics.

Applications to Secretary, Group 20 Hospital Management Committee, Stoney Stanton-road, Coventry.

RUGBY. HOSPITAL OF ST. CROSS, AND ST. MARY'S HOSPITAL, HARBOROUGH MAGNA. HOUSE OFFICER (gynæcology and obstetrics). Obstetrics 40 Beds. Gynæcology 12 Beds. Not pre-registration. Vacant mid-July. Resident.

Applications to Hospital Secretary, Hospital of St. Cross, Rugby.

RYDE, I.W. ROYAL I.W. COUNTY HOSPITAL. (116 Beds.) RESIDENT HOUSE SURGEON (pre-registration post and recognised for F.R.C.S.), vacant late July.

Applications, with names of 2 referees, to Hospital Secretary, not later than 25th June.

RYDE, I.W. ROYAL I.W. COUNTY HOSPITAL. (116 Beds.) RESIDENT HOUSE PHYSICIAN (pre-registration post), vacant early July.

Applications, with names of 2 referees, to Hospital Secretary, not later than 25th June.

SALISBURY GENERAL HOSPITAL. Salisbury Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of Locum RESIDENT or NON-RESIDENT CASUALTY OFFICER (Senior House Officer). Post vacant now.

Applications, naming 2 referees, to Group Secretary, Odstock Hospital, Salisbury, Wilts.

SALISBURY GENERAL HOSPITAL. Salisbury Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT HOUSE SURGEON (Orthopædic Department) which is open to pre-registration candidates, and which becomes vacant immediately. The Department has 35 Beds and a large outpatient turnover.

Applications, stating age, nationality, qualifications, experience, and naming 2 referees, to the Group Secretary, Odstock Hospital, Salisbury.

SALISBURY GENERAL HOSPITAL. Salisbury Group HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT or NON-RESIDENT CASUALTY OFFICER (Senior House Officer) for a period of 12 months. Post is recognised for F.R.C.S. and is vacant now.

Applications, naming 2 referees, to Group Secretary, Odstock Hospital, Salisbury.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR in Medicine at the Eastern General Hospital, Edinburgh.

Applications, giving particulars of age, qualifications and previous experience, together with the names of 2 referees, should be sent to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, by 9th July, 1955.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR in Orthopædic Surgery in the Royal Infirmary of Edinburgh.

Applications, giving particulars of age, qualifications and previous experience, together with the names of 2 referees, should be submitted to the Secretary, South-Eastern Regional Hospital Board, Scotland, 11, Drumsheugh-gardens, Edinburgh, 3, by 9th July, 1955.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the post of SENIOR HOUSE OFFICER in Obstetrics and Gynæcology at Stobhill Hospital, Glasgow. The appointment will be for 1 year in the first instance.

Applications, stating age, qualifications, experience and present appointment and naming 3 referees, to be lodged with the Secretary, Board of Management for Glasgow Northern Hospitals, 13, Woodside-place, Glasgow, C.3, by 30th June, 1955.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of REGISTRAR in Psychiatry based at Lennox Castle Institution, near Glasgow, which will be for 1 year in the first instance. This appointment is subject to the National Health Service (Scotland) superannuation regulations.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, by 4th July, 1955.

SCUNTHORPE. WAR MEMORIAL HOSPITAL. (267 Beds.) SCUNTHORPE HOSPITAL MANAGEMENT COMMITTEE. Vacancy for HOUSE SURGEON (Senior House Officer) end of June.

Applications, naming 2 referees, to Group Secretary.

SHOREHAM-BY-SEA, SUSSEX. SOUTHLANDS HOSPITAL. (453 Beds.) WORTHING GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of OBSTETRIC AND GYNÆCOLOGICAL REGISTRAR (85 Beds). M.R.C.O.G. preferred. The post will be vacant from 14th September, 1955.

Forms of application can be obtained from the undersigned, and must be returned as soon as possible.

A. V. OAKTON, Group Secretary.

129, Brighton-road, Worthing, Sussex.

SHREWSBURY. EYE, EAR AND THROAT HOSPITAL. SHREWSBURY HOSPITAL GROUP. SENIOR HOUSE OFFICER (E.N.T.), vacant 1st August, 1955. Duties at E.N.T. Hospital (68 Beds) and Copthorne Hospital (168 Beds). Post recognised for the D.L.O.R.C.S.

Applications, with copy testimonials, to the Group Secretary, Royal Salop Infirmary, Shrewsbury.

SHREWSBURY. ROYAL SALOP INFIRMARY. (241 Beds.) SHREWSBURY HOSPITAL GROUP. HOUSE SURGEON for general surgical duties (pre-registration post), vacant immediately.

Applications with copy testimonials to Group Secretary, Royal Salop Infirmary, Shrewsbury.

SHREWSBURY. ROYAL SALOP INFIRMARY, CHILDREN'S UNIT. SHREWSBURY HOSPITAL GROUP. SENIOR HOUSE OFFICER or HOUSE OFFICER (pædiatric), vacant immediately. The Unit consists of medical, surgical and fever beds.

Applications, with copy testimonials, to Group Secretary, Royal Salop Infirmary, Shrewsbury.

SHEFFIELD. CITY GENERAL HOSPITAL. Applications are invited for the resident appointment of HOUSE PHYSICIAN (general medicine). (Recognised pre-registration post.) Vacant on 15th July, 1955.

Applications giving full details of age, nationality, qualifications, present and previous appointments with dates, and the names of 2 persons to whom reference may be made, should be forwarded to W. STANSFIELD at Nether Edge Hospital, Sheffield, 11.

SHEFFIELD. CITY GENERAL HOSPITAL. Applications are invited for the resident appointment of HOUSE SURGEON (orthopædics). (Recognised pre-registration post.) Vacant on 15th July, 1955.

Applications, giving full details of age, nationality, qualifications, present and previous appointments with dates, and the names of 2 persons to whom reference may be made, should be forwarded to W. STANSFIELD at Nether Edge Hospital, Sheffield, 11.

SHEFFIELD. CITY GENERAL HOSPITAL. (Recognised for D.C.H.) Applications are invited for the resident appointment of HOUSE PHYSICIAN (pædiatrics). (Recognised pre-registration post.) Vacant 15th July, 1955.

Applications, giving full details of age, nationality, qualifications, present and previous appointments with dates, and the names of 2 persons to whom reference may be made, should be forwarded to W. STANSFIELD at Nether Edge Hospital, Sheffield, 11.

SHEFFIELD REGIONAL HOSPITAL BOARD. City GENERAL HOSPITAL, SHEFFIELD. Whole-time NON-RESIDENT SENIOR MEDICAL REGISTRAR required. The Hospital has teaching affiliations with Sheffield University and most of the Consultant staff have the status of Clinical Teachers. There is a Professorial Medical Unit and a Regional Cardiological Department. Appointment for 1 year in first instance reviewable annually. It has been agreed between the Sheffield Regional Hospital Board and the Board of Governors of the United Sheffield Hospitals that, subject to satisfactory work and progress, the tenure of the appointment will be divided between the City General Hospital and 1 of the Teaching Hospitals.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 4th July, 1955, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. ROYAL HOSPITAL UNIT. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER in Clinical Pathology at the above Hospital. Pathological experience not essential, but candidates must have previous clinical experience. The successful candidate will work in turn in the different branches of clinical pathology in the laboratories of the United Sheffield Hospitals.

Applications, stating age, qualifications and experience, with the names of 3 referees, should be sent immediately to the Superintendent, Royal Hospital, West-street, Sheffield, 1.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. HOUSE OFFICER (casualty) required, 1 of 2, for busy Casualty Department. Experience provided in orthopædic and plastic cases.

Applications, stating age and qualifications, with copies of 2 testimonials, to Hospital Secretary.

SOUTHALL, MIDDLESEX. ST. BERNARD'S HOSPITAL FOR NERVOUS AND MENTAL DISORDERS. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR required at above Hospital. Hospital undertakes all modern psychiatric treatments both physical and psychotherapeutic, and the medical staff conduct several psychiatric outpatient clinics. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, the Group Secretary, St. Bernard's Hospital Management Committee, St. Bernard's Hospital, Southall, Middlesex, by 25th June, 1955.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL (278 Beds) AND SOUTHAMPTON GENERAL HOSPITAL (471 Beds). SENIOR HOUSE OFFICER (E.N.T.) required in June. This post is recognised for the F.R.C.S. (Eng.) and D.L.O. examinations and provides experience in all branches of E.N.T. work, including audiometry. The Group includes a diagnostic and distributing hearing-aid centre.

Applications, with copies of recent testimonials, should be forwarded as soon as possible to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for a whole-time appointment as RESIDENT SURGICAL OFFICER to fill a vacancy in the approved establishment at the Sidcup and Swanley Group of hospitals, as from 1st August, 1955. The successful candidate will be required to reside at Queen Mary's Hospital, Sidcup. Married quarters are available. The salary will be £965 p.a. and the appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance, renewable for a further year.

Applications, giving particulars of age, qualifications, and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 2nd July, 1955.

SOUTHEND-ON-SEA. GENERAL HOSPITAL. Applications are invited for the post of RESIDENT GYNÆCOLOGICAL HOUSE SURGEON, vacant 16th July. Post recognised for M.R.C.O.G.

Applications, &c., to reach the undersigned not later than 29th June, 1955.

J. C. FIELD, Secretary.

SOUTHEND-ON-SEA. GENERAL HOSPITAL. Applications are invited from fully registered practitioners for the post of RESIDENT HOUSE PHYSICIAN (House Officer grade). Post vacant 1st August, 1955. Appointment primarily to Pædiatric Department, with duties in Cardiological and Skin Departments. Post recognised for D.C.H.

Applications, stating age, qualifications, and previous experience, with copies of recent testimonials, should reach the undersigned at the Hospital by 30th June, 1955.

J. C. FIELD, Secretary.

SOUTHEND-ON-SEA. GENERAL HOSPITAL. Applications are invited from registered or provisionally registered practitioners for appointment as RESIDENT GENERAL HOUSE PHYSICIAN. Post vacant 6th July, 1955. Salary according to previous appointments held, less the prescribed charge for residential emoluments.

Applications, stating age, qualifications and previous experience, with copies of recent testimonials (1 testimonial sufficient from applicants for first appointment) and quoting reference H.P.1, to reach the undersigned by 23rd June, 1955.

J. C. FIELD, Secretary.

SOUTHEND-ON-SEA. GENERAL HOSPITAL. Applications are invited from registered or provisionally registered practitioners for appointment as RESIDENT HOUSE SURGEON. Post vacant 10th July, 1955. Salary according to previous appointments held, less the prescribed charge for residential emoluments.

Applications, stating age, qualifications and previous experience, with copies of recent testimonials (1 testimonial sufficient from applicants for first appointment), to reach the undersigned by 22nd June, 1955. J. C. FIELD, Secretary.

SOUTHPORT GENERAL INFIRMARY. (185 Beds. Recognised for pre-registration.) HOUSE PHYSICIAN. Post vacant late July or early August.

Apply to Group Secretary, Southport and District Hospital Management Committee, Promenade Hospital, Southport.

SOUTHPORT GENERAL INFIRMARY. (185 Beds. Recognised for F.R.C.S. and pre-registration.) HOUSE SURGEON (general surgery and ophthalmology). Post vacant late July or early August, 1955.

Apply to Group Secretary, Southport and District Hospital Management Committee, Promenade Hospital, Southport.

STAFFORD. STAFFORDSHIRE GENERAL INFIRMARY. (175 Beds—Recovery Unit 32 Beds.) HOUSE PHYSICIAN (pre-registration post), vacant July.

Applications to Group Secretary, Stafford Hospital Management Committee, 13, Foregate-street, Stafford.

STAFFORD. STAFFORDSHIRE GENERAL INFIRMARY. (175 Beds—Recovery Unit 32 Beds.) HOUSE SURGEON (pre-registration post), vacant July.

Applications to Group Secretary, Stafford Hospital Management Committee, 13, Foregate-street, Stafford.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. HOUSE OFFICER (pædiatrics) required, vacant July. Recognised pre-registration.

Applications to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT (near). HAYWOOD HOSPITAL. (96 Beds.) RESIDENT SURGICAL OFFICER (Junior Hospital Medical Officer) required. Hospital staffed by Group Consultants.

Applications to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT (near). HAYWOOD HOSPITAL. (96 Beds.) RESIDENT MEDICAL OFFICER (Junior Hospital Medical Officer) required. Hospital staffed by Group Consultants.

Applications to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

SECOND ADVERTISEMENT

ST. ALBANS CITY HOSPITAL, St. Albans, Hertfordshire. (384 Beds.) CASUALTY OFFICER (Registrar grade) required for the above Hospital. Post recognised for the F.R.C.S. regulations, and preference will be given to such candidates. Appointment tenable for 6 months from approximately 3rd July, 1955, and subject to review at the end of this period.

Application forms obtainable from, and returnable to, Group Secretary, Mid Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans, by 24th June, 1955.

ST. ALBANS CITY HOSPITAL, St. Albans, Hertfordshire. (384 Beds.) Locum Tenens CASUALTY OFFICER (Registrar grade) required from 3rd July, 1955, for an indefinite period.

Applications to Group Secretary, Bleak House, Catherine-street, St. Albans.

ST. ALBANS CITY HOSPITAL, St. Albans, Hertfordshire. (384 Beds.) Locum Tenens SURGICAL REGISTRAR required for general surgical team with orthopædic duties from 16th July to 6th August, 1955, approximately.

Applications to Group Secretary, Bleak House, Catherine-street, St. Albans.

ST. HELENS AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of CASUALTY OFFICER vacant in July, in the Senior House Officer grade, at the St. Helens Hospital (196 Beds). The post is recognised for the examination for the F.R.C.S.

Applications, stating age, qualifications, and experience, and giving 2 names for reference, should be forwarded immediately to N. RICHARDS, Secretary.

Group Office, Whiston Hospital, Prescot, Lancs.

SWINDON AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE, SWINDON HOSPITALS. (520 Beds.) Applications are invited for the post of RESIDENT HOUSE PHYSICIAN in acute Medical Unit of 64 Beds at St. Margaret's Hospital. Post recognised for training under pre-registration Internship regulations, and is vacant on a date to be arranged between 10th–24th July, 1955.

Full details, together with names of 2 referees, to Secretary, 7, Okus-road, Swindon, Wilts, not later than 23rd June.

TORQUAY. TORBAY HOSPITAL. (166 general beds). RESIDENT HOUSE OFFICER (surgical) Male or Female, required immediately. Post recognised for F.R.C.S. and pre-registration purposes. There is a complement of 5 Resident House Officers.

Applications, stating qualifications, nationality, and age, together with copy testimonials (quoting reference F. 955/58) to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, S. Devon.

TYNEMOUTH VICTORIA JUBILEE INFIRMARY. (109 Beds.) SOUTH EAST NORTHUMBERLAND HOSPITAL MANAGEMENT COMMITTEE. RESIDENT SURGICAL OFFICER required for general surgical duties. Junior Hospital Medical Officer grade (£775–£850–£1075 p.a.—less deduction for board-residence).

Applications, with names of 2 referees, to Group Secretary, Preston Hospital, North Shields.

TAPLOW, near MAIDENHEAD, BERKSHIRE. CANADIAN RED CROSS MEMORIAL HOSPITAL. HOUSE SURGEON required for Unit of Obstetrics and Gynæcology, vacant 6th July Post recognised for M.R.C.O.G.

Applications, stating age, experience and qualifications with dates, with copies of 2 testimonials, to Hospital Secretary.

TAUNTON HOSPITAL MANAGEMENT COMMITTEE. TAUNTON AND SOMERSET HOSPITAL. Applications are invited for HOUSE OFFICER (general surgery). Post vacant from 1st July, 1955. Recognised for the F.R.C.S. Recognised for pre-registration candidates.

Applications, stating age, nationality, and qualifications, together with the names of 2 referees, should be forwarded immediately to the Group Secretary, Taunton and Somerset Hospital, Musgrove Park Branch, Taunton, Somerset.

TOLWORTH HOSPITAL, Red Lion-road, Tolworth. (100 Beds approximately.) KINGSTON GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited from suitably qualified and experienced medical officers for the post of RESIDENT MEDICAL OFFICER (Registrar grade). Duties will be concerned with pædiatrics and communicable diseases with relief duties in the Pædiatric Unit at Kingston Hospital.

Forms of application are obtainable from the Group Secretary, 35, Coombe-road, Kingston-on-Thames (a foolscap stamped addressed envelope should be enclosed), and the completed forms should be returned to him within 14 days of the appearance of this advertisement.

WAKEFIELD. PINDERFIELDS GENERAL HOSPITAL. Applications invited for positions, of SENIOR HOUSE OFFICERS in the Thoracic Surgical and Orthopædic Departments, or Locum Tenens SENIOR HOUSE OFFICER (thoracic). Salary for Senior House Officers will be £745 p.a. For the Locum Tenens appointment payment will be at the rate of £14 10s. a week. In all cases a charge of £155 p.a. will be made for residential accommodation.

Address written applications, giving full personal particulars, details of experience, &c., together with 2 names and addresses for reference, to W. BOWRING, Group Secretary.

Victoria Chambers, Wood-street, Wakefield.

WARRINGTON INFIRMARY. (172 Beds.) Applications are invited from Males or Females for the post of RESIDENT HOUSE PHYSICIAN (pre-registration or Senior House Officer) at the above Hospital. Salary will be £425–£525 p.a., less a deduction of £125 for full residential emoluments, or Senior House Officer grade—£745 p.a., less £130 for residential emoluments.

Applications should be forwarded to—

H. L. BOOT, Group Secretary,

Warrington and District Hospital Management Committee.

c/o General Hospital, Warrington, Lancs.

WATFORD, HERTFORDSHIRE. PEACE MEMORIAL HOSPITAL. (198 Beds.) Applications are invited for the post of CASUALTY AND ORTHOPÆDIC HOUSE SURGEON. Salary according to National Health Service scale.

Applications, with copies of 2 testimonials, to the Administrator.

WATFORD HOSPITALS. North West Metropolitan REGIONAL HOSPITAL BOARD. ANÆSTHETIC REGISTRAR (resident) required for the above Hospitals. Post vacant immediately.

Application forms obtainable from, and returnable to, Secretary, West Herts Group Hospital Management Committee, 9, Rickmansworth-road, Watford, Herts, by not later than 10 days after the appearance of this advertisement.

WELSH REGIONAL HOSPITAL BOARD. Registrar (obstetrics and gynæcology), to serve Mid-Glamorgan Hospital Management Committee. Based at Bridgend General Hospital. May also be expected to serve other hospitals within Group. Hospital recognised for M.R.C.O.G. Resident. Subject to review end of first year.

Application forms from Senior Administrative Medical Officer, Temple of Peace, Cathays Park, Cardiff, within 14 days.

WEST FIFE HOSPITALS BOARD OF MANAGEMENT. Applications are invited from suitably qualified medical practitioners, for the post of REGISTRAR or JUNIOR HOSPITAL MEDICAL OFFICER (resident) at Glenlomond Hospital, By Kinross (140 Beds—Respiratory and non-respiratory tuberculosis). The post is superannuable under the National Health Service superannuation regulations; salary and conditions of service in accordance with national agreements.

Applications, giving full details of previous experience should be lodged with the Physician-Superintendent, Glenlomond Hospital, by Kinross.

WHITEHAVEN HOSPITAL, Cumberland. (124 Beds, plus 27 Beds in Annexe.) HOUSE SURGEON, with orthopædic and casualty duties. (Recognised pre-registration, Senior House Officer grade if appropriate.) Vacant now. Furnished married quarters will be available.

Detailed applications, with dates and copies of 2 testimonials, to Group Secretary, Workington Infirmary, Cumberland.

WIGAN. ROYAL ALBERT EDWARD INFIRMARY. 2 HOUSE SURGEONS (pre-registration posts). Recognised F.R.C.S. 1st vacant 7th July (general duties), 2nd vacant 17th July (casualty duties).

Applications, with names of 2 referees, to Secretary, Wigan Infirmary.

WINDSOR. KING EDWARD VII HOSPITAL. Casualty OFFICER required (Senior House Officer grade) for post vacant 2nd July. Department forms part of Accident Service of Windsor Group; duties include House Surgeon to E.N.T. and Eye Departments. Previous experience in treatment of acute injuries desirable.

Applications, stating age, qualifications with dates and nationality, and copies of recent testimonials, to Hospital Secretary, by 24th June.

WINDSOR. KING EDWARD VII HOSPITAL. House SURGEON in General Surgery required, Male or Female, for post vacant 21st July. Recognised for F.R.C.S. Preference given to persons seeking pre-registration post. Applicants required to be members of a Medical Protection Society.

Applications stating age, nationality, qualifications with dates, and copies of recent testimonials, to Hospital Secretary, by 30th June.

WINDSOR. KING EDWARD VII HOSPITAL. House PHYSICIAN (paediatrics) required, Male or Female, for post vacant 3rd August. Hospital recognised for D.C.H. Preference given to persons seeking pre-registration post. Successful candidate will be resident at Old Windsor Unit of Hospital. Applicants required to be members of a Medical Protection Society.

Applications, stating age, nationality, qualifications with dates, and experience, with copies of 3 testimonials, to Hospital Secretary by 3rd July.

WINCHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. ORTHOPÆDIC REGISTRAR (Registrar grade), resident or non-resident, for Orthopædic Unit of the Group. The Group is served by orthopædic team covering Winchester, Southampton, Salisbury and Isle of Wight areas. A wide variety of experience in orthopædic conditions is available.

Forms of application obtainable from Group Secretary, Royal Hampshire County Hospital, Winchester, should be completed and returned not later than 4th July.

WOKING. THE ROWLEY BRISTOW ORTHOPÆDIC HOSPITAL, PYRFORD, WOKING, SURREY. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of REGISTRAR (non-resident), at the above Hospital for 1 year in the first instance. The duties entail some outpatient work at St. Thomas's Hospital and will begin on 20th September.

Applications to be on forms obtained from the Group Secretary at the above address and completed forms should be returned within 14 days of the date of this advertisement. Canvassing will disqualify, but candidates may visit the Hospital.

WOLVERHAMPTON GROUP.

The Royal Hospital (an Associated Hospital of the University of Birmingham Medical School)

HOUSE OFFICER (casualty), vacant now.
HOUSE OFFICER (E.N.T. Department), vacant 7th July.
SENIOR HOUSE OFFICER or HOUSE OFFICER (Fracture and Orthopædic Department), vacant now.
*3 HOUSE OFFICERS (general surgery), vacant July.
*HOUSE OFFICER (pædiatric), vacant 16th July.

Women's Branch

*HOUSE OFFICER (gynæcological and obstetric), vacant 24th July. Appointment recognised for M.R.C.O.G.

*Approved for Pre-registration Service.

Apply, with copies of testimonials, to Secretary, The Royal Hospital, Wolverhampton.

WOODFORD BRIDGE, WOODFORD GREEN, ESSEX. CLAYBURY HOSPITAL (for nervous and mental disorders). Applications are invited for the post of Full-time SENIOR HOUSE OFFICER (resident or non-resident). Board-residence for an unmarried applicant, for which a charge of £150 p.a. will be made, is available. The Hospital has over 2000 Beds and an admission-rate of over 1200 a year. All forms of treatment are undertaken and outpatient clinics at general hospitals are run by the Hospital Staff. Clinical conferences and seminars for the D.P.M. candidates are held weekly and facilities will be offered to attend lectures in London (1 hours journey). Previous general but not psychiatric experience necessary.

Applications, with full particulars, and the names and addresses of 2 referees, to be sent to Physician-Superintendent not later than 14 days after the appearance of this advertisement.

WORCESTER. RONKSWOOD HOSPITAL. Applications invited for post of HOUSE SURGEON (pre-registration).

Applications, with copies of testimonials, to Hospital Secretary.

YORKSHIRE. EAST RIDING HOSPITAL MANAGEMENT COMMITTEE.

Westwood Hospital, Beverley, Yorks (220 Beds)

ORTHOPÆDIC HOUSE SURGEON (first, second, or third post). Offers good opportunity for general experience in busy acute general hospital. Approved pre-registration post. Fully qualified practitioners may apply. Recognised for F.R.C.S.

Apply to Group Secretary.

DUBLIN. INCORPORATED ORTHOPÆDIC HOSPITAL OF IRELAND, Castle-avenue, CLONTARF, DUBLIN. (142 Beds.) Applications are invited from registered medical practitioners for the post of RESIDENT MEDICAL OFFICER, vacant September, 1955. Post offers good experience and opportunities for postgraduate study. Tenable for 12 months. Salary according to experience, minimum £250 p.a.

Applications, stating age, qualifications and experience, to be addressed to the Hospital Secretary.

MICHIGAN, U.S.A. OAKWOOD HOSPITAL, Dearborn, MICHIGAN. Applications are invited for 1 or 2 year General Practice RESIDENCY in new 230-Bed general hospital 10 miles from Detroit. Excellent facilities. Hospital approved for exchange-visitor programme. Salary begins at $275 per month.

Apply : Director.

Public Appointments

FACTORY DOCTORS. Factories Acts, 1937 and 1948. The following appointments as Appointed Factory Doctor are vacant. Apply to Chief Inspector of Factories, 19, St. James's-square, London, S.W.1.

District	*County*	*Latest date for receipt of applications*
SOUTHWELL ..	NOTTINGHAM ..	2ND JULY, 1955
DEWSBURY ..	YORK	2ND JULY, 1955
TOOTING ..	LONDON	2ND JULY, 1955

BARROW-IN-FURNESS. COUNTY BOROUGH OF BARROW-IN-FURNESS. Applications are invited from fully qualified and registered medical practitioners for the appointment of ASSISTANT MEDICAL OFFICER OF HEALTH AND SCHOOL MEDICAL OFFICER. Salary is as laid down by the Medical Council of the Whitley Councils for the Health Services (£950 p.a., rising by annual increments of £50 to £1300 p.a.), and the point of entry will be fixed in accordance with the qualifications and experience of the person appointed. The appointment will be subject to the Corporation's general conditions of service and is superannuable. As the duties are mainly in connection with the School Health Service and Maternity and Child Welfare Service, the possession of the D.P.H. or D.C.H. will be an advantage.

Further particulars and application forms may be obtained from the Medical Officer of Health, Town Hall, Barrow-in-Furness. Completed applications must be received by the undersigned not later than NOON on Monday, 4th July, 1955.

LAWRENCE ALLEN, Town Clerk.

Town Hall, Barrow-in-Furness.

GOVERNMENT OF MAURITIUS. Junior Pathologist required in the Medical Department, Mauritius, to perform all the duties normally done by a qualified person in a clinical laboratory. Candidates must have medical qualifications registrable in the United Kingdom and preferably have post-graduate experience in subjects related to clinical pathology, especially histology and hæmatology including blood transfusion and bacteriology. Appointment on contract with gratuity (taxable) for 3 years. Salary scale is Rs.10,740–Rs.19,020 (£805 10s.–£1426 10s.) a year ; starting salary depending upon qualifications and experience. In addition a temporary non-pensionable cost-of-living allowance is payable which amounts to 11% on salary not exceeding Rs.12,000 (£900) a year and 8% on salary over Rs.12,000 (£900) p.a. Gratuity is payable after satisfactory completion of contract and is assessed at the rate of £37 10s. for each completed period of 3 months while salary is below £1000 a year and £50 for each similar period when salary is over £1000 a year. Government of Mauritius would pay employer's share of pension contributions (if applicable). Quarters are not provided, but officers who have not been allocated Government houses will be reimbursed any difference between approved rent paid for a private house (subject to a maximum of Rs.250 (£18 15s.) a month) and the 10% salary they would normally pay for a Government house. For this purpose, officers residing in hotels or boarding houses will be regarded as paying half the board and lodging charge for themselves and their wives in respect of rent. Income-tax at local rates. Free passages in both directions are provided for Officer, wife and children not exceeding 5 persons in all. Generous home leave is granted after each tour of 3 or 4 years.

Application forms from the Director of Recruitment, Colonial Office, Sanctuary Buildings, Great Smith-street, London. S.W.1 (quoting reference No. BCD.117/52/01).

HER MAJESTY'S OVERSEA CIVIL SERVICE. SOMALILAND PROTECTORATE. MEDICAL OFFICER required for general medical duties in Somaliland, including simple surgery and, if posted to Hargeisa, assistance with training of subordinate staff. Appointment can be made on a permanent basis with pension (non-contributory) at the age of 55 or on short-term contract with gratuity. Permanent officers have opportunities for transfer and promotion outside Somaliland. Salary scale, ranges from £1116 to £1836 a year, plus a temporary (non-pensionable) cost-of-living allowance of 10% of salary subject to a maximum of £162 a year. Commencing salary is determined according to qualifications and experience. Pension is earned at the rate of 1/600th of final pensionable emoluments for each completed month of service. Furnished quarters are provided at low rental. Free passages provided in both directions for Officer, wife, and up to 4 children under 18 years. There is, at present, no income-tax. Tour of service is 15–21 months, after which generous home leave is granted. Local leave is also granted. There is good riding throughout the country. Candidates must possess medical qualifications registrable in the U.K.

Application forms from Director of Recruitment, Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. BCD.117/5/01).

LINCOLN. CITY AND COUNTY OF THE CITY OF LINCOLN. Appointment of DEPUTY MEDICAL OFFICER OF HEALTH AND DEPUTY PRINCIPAL SCHOOL MEDICAL OFFICER. Applications are invited for this appointment from persons holding the D.P.H. or its equivalent, with previous experience in the Public Health, School Health and Maternity and Child Welfare Services. The post is superannuable. The salary scale is £1150–£50–£1350 p.a. and the commencing salary will be according to the experience of the successful candidate. Car mileage allowance. The Council recognise the post as one for priority housing accommodation.

Application forms and particulars of conditions of service may be obtained from the Medical Officer of Health, City Health Department, Beaumont Fee, Lincoln, by whom completed applications should be received not later than 17th July, 1955

J. HARPER SMITH, Town Clerk.

Town Clerk's Office, Lincoln, 2nd June, 1955.

MANCHESTER. CITY OF MANCHESTER. Applications are invited for the following appointments :—

(*a*) MEDICAL OFFICER, School Health Service, with half-time duties in the Health Department, Maternity and Child Welfare Section.

(*b*) MEDICAL OFFICER, Maternity and Child Welfare, Health Department, with half-time duties in the School Health Service.

Salary scale in accordance with Medical Whitley Council, viz. : £950–£50–£1300 (under review).

Application forms and particulars for both posts from the Town Clerk "I" Town Hall, Manchester, 2, to whom completed forms should be returned not later than 14 days after the appearance of this advertisement.

LANCASHIRE COUNTY COUNCIL. Registered medical practitioners required for appointment as ASSISTANT DIVISIONAL MEDICAL OFFICERS in Administrative County Area adjacent to Blackburn and at Chadderton, Fleetwood, Lytham St. Annes and Leigh. Possession of D.P.H. desirable. Salary £975–£1375 p.a. Travelling and subsistence allowances where applicable.

Application forms and further particulars from County Medical Officer, Serial 193, East Cliff County Offices, Preston.

ROTHERHAM. COUNTY BOROUGH OF ROTHERHAM. MEDICAL OFFICER OF HEALTH AND PRINCIPAL SCHOOL MEDICAL OFFICER. Applications are invited for this whole-time appointment from suitably qualified registered medical practitioners. The conditions of service will be as prescribed by Committee "C" of the Medical Whitley Council. Car allowance on "casual users" scale. Salary £1750–£50–£2000 p.a. subject to review on publication of award of Industrial Court.

Details of the appointment may be obtained from the undersigned, to whom applications endorsed "Medical Officer of Health" stating age, qualifications and experience, together with the names and addresses of 3 persons to whom reference may be made, should be delivered not later than 1st July, 1955. Canvassing will disqualify.

JOHN S. WALL, Town Clerk.

Municipal Offices, Rotherham, 3rd June, 1955.

SUDAN GOVERNMENT. The Ministry of Health, Sudan Government, invites applications for the following posts:—

MEDICAL ENTOMOLOGIST. Candidates must have Honours Degree and must be fully literate in either Arabic or English. Age limits 22–45 years. Salary range from £E1075 to £E2330 p.a.

MEDICAL PATHOLOGIST. Candidates must have Honours Degree and must be fully literate in either Arabic or English. Age limits 22–45 years. Salary range from £E1750 to £E2330 p.a. (for Junior Specialist) or a fixed salary of £E2500 p.a. (for Specialist).

ANALYTICAL CHEMIST. Duties are in the Government Analyst's Laboratory in Khartoum and include the analysis of waters, foods, drugs, dairy produce and certain clinical specimens, toxicology, forensic chemistry and general miscellaneous analysis, including minerals and Metolo. Some opportunities for research are open to the keen worker. Candidates should possess a good Honours Degree in Chemistry or A.R.I.C. and should have had several years postgraduate experience, preferably in general analytical work. Age limits 26–32 years. Salary range from £E1075 to £E2330 p.a.

BACTERIOLOGISTS. Candidates should have specialist experience in Bacteriology, and in a reputed Institute. Salary range from £E1750 to £E2330 p.a. (for Junior Specialist) or a fixed salary of £E2500 p.a. (for Specialist).

All the above appointments will be on short-term contract for a period of up to 5 years and starting rates of pay will be determined according to age, experience and qualifications. In certain cases a cost-of-living allowance is also payable at present. A bonus of 1 months salary is payable, on satisfactory completion of the contract, for each year of service. Outfit allowance of £E50 is payable when the contract is signed. Free passage on appointment. Annual leave after the first tour.

Further particulars and application form may be obtained from Dr. E. P. PRATT, 93, Harley-street, London, W.1. Please mention the appointment concerned and give name and address in block letters.

WEST LOTHIAN. COUNTY COUNCIL OF THE COUNTY OF WEST LOTHIAN. Applications are invited from registered medical practitioners (Male) holding the D.P.H., for the permanent post of ASSISTANT MEDICAL OFFICER OF HEALTH. The duties are mainly those of the School Health Service, but include work in connection with the Public Health Preventive Services, aged persons, and infectious disease. Proficiency in tuberculin skin testing and B.C.G. vaccination will be an advantage. Possession of a car, for which an allowance will be provided, is essential. Salary scale £950–£1300 by annual increments of £50, with placing according to experience. The post is superannuable.

Applications, giving full details of age, qualifications and experience, together with the names of 3 referees, to be lodged with the undersigned within 14 days of the appearance of this advertisement. JOHN CALDER, County Clerk.

County Buildings, Linlithgow, 3rd June, 1955.

SASKATCHEWAN DEPARTMENT OF PUBLIC HEALTH

REGIONAL MEDICAL HEALTH OFFICER required.

Salary range.—$7524–$8688 p.a. Salary recognition is given to those possessing Certification as a Specialist in Public Health from the Royal College of Physicians and Surgeons (Canada).

Requirements.—Applicants should be under 45 years of age; should have had some medical and administrative experience; should possess a registerable qualification in medicine for the Province of Saskatchewan, and a Diploma from a recognised School of Public Health.

Duties.—This is a professional medical and administrative post in an area with a population of approximately 50,000. The holder will be required to develop regional preventative health services and a general public health programme.

Benefits.—3 weeks annual vacation with pay; 3 weeks sick leave, accumulative; suitable superannuation scheme.

Application forms and details concerning duties and responsibilities may be obtained from the Personnel Officer, Department of Public Health, Provincial Health Building, Regina, Sask., Canada.

WESTERN AUSTRALIA. STATE PUBLIC SERVICE. MENTAL HEALTH SERVICES. MEDICAL OFFICERS (grade I) Psychiatrists (2) permanent.

Salary range: £A2093–£A2143 (gross) p.a. on current basic wage plus allowance of £A100 p.a. if in possession of D.P.M. or its equivalent.

Qualifications: Applicants must be registrable as medical practitioners in Western Australia. Experience in psychiatry essential.

Accommodation: Furnished residence, light, fuel and laundry free or allowance in lieu if residence not available immediately. Quarters available for single man with charge of £A3 per week for board.

Transport: Fares and other reasonable transport expenses incurred by appointee and dependent family in travelling to Western Australia will be payable by the State provided appointee enters into bond to serve State for period of at least 3 years.

Conditions of appointment: First appointment will be at Claremont Mental Hospital located within 6 miles of Perth and easily accessible thereto. Permission will be granted to take up paid sessions at an Outpatient Psychiatric Clinic estimated to be worth £A300–£A500 p.a.

Conditions of service: Superannuation benefits; long service leave (3 months after each period of 7 years continuous service); 4 weeks annual leave; liberal sick leave concessions and other general conditions applicable to permanent public servants.

Further particulars available from Official Secretary, London Agency.

Applications, in duplicate, stating age, qualifications, marital status and experience, should be addressed by 4th July, 1955, to Official Secretary, Western Australian Government Agency, Savoy House, 115/116, Strand, London, W.C.2.

Hospital Services: Non-Medical Appointments

GUY'S HOSPITAL MEDICAL SCHOOL, London Bridge, S.E.1. Applications are invited for the post of JUNIOR ASSISTANT in the Department of Medical Photography. Salary scale £365–£425, plus London weighting, according to qualifications and experience. Candidates should hold the Intermediate I.B.P. examination or similar qualifications. Medical experience is not essential.

Apply, giving details of previous experience, to the Secretary.

Miscellaneous

To non-professional posts the Notification of Vacancies Order 1952 applies.

Medical Missionary Society, U.C.C. Applications are invited for medical posts in Catholic Mission hospitals:—

(1) Gold Coast: Contract 2 years; salary £1000 p.a.; First-class passage to and from the Gold Coast; furnished house; rent free; use of car.

(2) Nigeria: 2 posts vacant. Conditions as above.

(3) India, Rawalpindi: (*a*) Woman required for post as Surgeon in well-equipped hospital; (*b*) Qualified woman required as Technician in pathological laboratory. Particulars on request.

(4) Medical posts also vacant in Catholic Mission Hospitals in Tanganyika and other territories. Particulars supplied on request.

Applications to the Hon. Secretary, Medical Missionary Society, University College, Cork, Eire.

Oil Company in the British West Indies invites applications from registered medical practitioners for the position of ASSISTANT MEDICAL OFFICER. Duties will include dispensary and General Hospital work. Candidates should be between 30 and 35, with good general experience. Basic salary from £1500 p.a., plus allowances and pension scheme.—Apply, with brief particulars to: Address, No. 142, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Radiologist, diagnostic, consultant, free undertake locums.—Address, No. 139, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Luxury conversion. 4 self-contained flats. Central heating. St. John's Wood. Fully let producing £850. 97 years lease. Ground-floor flat available if required, suitable practice and/or private. Reception-room 35 ft. parquet floor, 3 bedrooms, 1 dining, large kitchen, 2 baths (1 shower). Balcony to large garden. £12,000 or near offer. Plans available for large garage.—Address, No. 143, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Applicants for posts requiring testimonials copied or duplicated should communicate with MANTON SECRETARIAL SERVICE LTD., 98, Victoria-street, S.W.1 (Phone: VICtoria 0141), who are specialists in this kind of work.

Typewriting and Duplicating. First-class work at moderate prices by experienced medical typists.—SYBIL RANG, 21, Heath-street, Hampstead, London, N.W.3 (HAM. 5329/0504).

"Pregnancy Diagnosis by the Xenopus Method," 24-hour service. Send specimen of urine and £1 1s. fee. Hematology, Biochemistry, Flame Photometry.—WELBECK BIOLOGICAL LABORATORIES, 26, Park-crescent, Portland-place, W.1 (MUSeum 5386–7).

Wanted. Gillies, Marrett or similar portable Absorber Anæsthetic apparatus, also sundries.—Address, No. 140, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

Austin. The New Show Models A.30, A.40, A.50 and A.90. Limited number of orders now acceptable from proven essential users for delivery ahead.—Demonstrations, easy terms, brochures, application forms on request, from H. A. SAUNDERS LIMITED, Austin House, 140–144, Golders Green-road, Golders Green, London, N.W.11.

PUBLISHED by the PROPRIETORS, THE LANCET LIMITED, 7, Adam Street, Adelphi, in the County of London.
Printed by HAZELL, WATSON & VINEY, LTD., London and Aylesbury—Saturday, June 18, 1955.
PRINTED IN GREAT BRITAIN—Entered as Second Class at the New York, U.S.A., Office.

New comprehensive treatment for specific and non-specific diarrhoea

'CREMOMYCIN'

'SULFASUXIDINE'-NEOMYCIN SUSPENSION *Trade Mark*

SHARP & DOHME

. . . combined antibacterial activities of 'Sulfasuxidine' and neomycin

RAPID RELIEF

The action of 'Cremomycin' is prompt, complete and effective. Within a few hours, the combined bactericidal and bacteriostatic activity of 'Cremomycin' is concentrated in the intestinal tract. This concentration means effective action—and prompt relief for the patient.

PROMPT REMISSION

There are many obvious advantages (besides relief for the patient) in prompt recovery from diarrhoea: prevention of severe losses of body fluids; reduction of local irritation; protection against complications; avoidance of the spread of infective organisms.
Moreover, secondary constipation is not encountered after therapy with 'Cremomycin'.

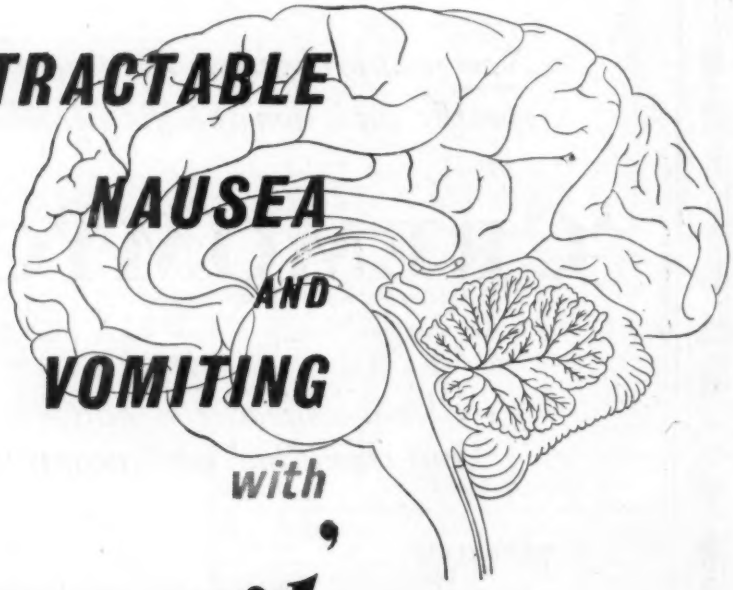
Each 30 ml. (approximately 1 fl. oz.) contains: 'Sulfasuxidine' Succinylsulphathiazole 3 G., Colloidal Kaolin 3 G., and Neomycin Sulphate 300 mg.
'Cremomycin' Suspension is supplied in bottles of 8 fluid ounces.
Descriptive literature will gladly be sent on request.

SHARP & DOHME LTD., HODDESDON, HERTS.

Control of INTRACTABLE NAUSEA AND VOMITING with 'Largactil'

trade mark brand

CHLORPROMAZINE HYDROCHLORIDE



Chlorpromazine has now been used with success in a wide variety of conditions in which nausea and vomiting are the main or complicating symptoms.

World-wide published reports reveal that excellent and often dramatic results have been obtained in controlling vomiting whether induced by disease — for example by cancer, uraemia, or cholecystitis — after surgery, or resulting from drug intolerance, radiation therapy, or pregnancy. Prompt control of nausea and vomiting is only one of the many clinical uses of 'Largactil' now being increasingly adopted in general practice. Detailed information is available and will gladly be sent on request.

SUPPLIES

Two strengths of tablets — 10 mgm. and 25 mgm.

Syrup containing 25 mgm. per 3·6 c.c. (approx. 1 teaspoonful).

Solutions for injection — 1% in 5 c.c. ampoules. 2·5% in 1 c.c. and 2 c.c. ampoules.

Suppositories — 100 mgm.

MANUFACTURED BY MAY & BAKER LTD

MA2572

An M&B brand Medical Product

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